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A Beginning of Rail Orders

Several Other Roads About to Place Contracts

Bar Specifications No Longer Withheld—Sharp
Curtaiment in Tin Plate

Rail buying for 1911 has begun, the various rail manufacturers having opened their books in the past week. The Erie has practically closed for about 33,000 tons, and the Pennsylvania and New York Central requirements are now under consideration, as are those of the Norfolk & Western. Several Western roads are also making up their estimates. The important question is whether these usual and expected purchases will be on a scale which, together with orders for equipment and supplies, will prove a real stimulus to the steel industry, prepared as it is to cope with double the business now coming in.

Announcement is made that rail prices will be quoted hereafter by the pound instead of the gross ton—an innovation that has been long considered. The familiar \$28 quotation for a 2240-lb. ton of Bessemer rails is replaced by 1.25c. per pound, which is the identical rate of the past nine years. Open hearth rails, heretofore \$30 a gross ton, are now 1.34c. per pound. Extras for lots less than 500 tons and 20 tons, respectively, correspond to the \$2 and \$4 per ton heretofore charged, making the price for Bessemer rails 1.34c. in less than 500-ton lots and 1.43c. in less than 20-ton lots.

Car orders, which had dwindled to dribblets, are more encouraging. The Lackawanna has bought 1000 cars and 1000 will be built for the New York Central at the shops of the Merchants' Dispatch. The Hawley lines have revived their inquiry, and it is now for 4250 cars. The Pennsylvania Railroad is also expected to come into the market soon.

Prices of finished materials show that co-operation among producers is effective in the main. There is shading by smaller mills on bars and wire products, and in plain structural material the price asked by leading manufacturers has been cut \$1 a ton, but these cases are the exception.

The shutting down of a large number of tin plate mills is the chief development of the week. Cannery shipments are over for the most part, and some curtailment is therefore seasonable. This year it is more drastic than usual, as no stocks will be accumulated on a 36c. tin market. By another week nearly one-third of the capacity of the leading producer of tin plates will be idle and independent companies are expected to make some reduction also. Such action may have a salutary effect on the cornerers of tin, who have had things pretty much their own way thus far.

Agricultural works, after withholding specifications for steel bars for some weeks, apparently looking for a decline, have been ordering freely on their contracts in the past 10 days. The recent sales of

1.35c. bars in the Chicago district threatened to affect contract business, but the larger sellers have maintained the 1.40c. basis, while the smaller producers, who were shading prices, are believed to be well sold up.

Prospects are better in the structural trade. The American Bridge Company will build the Florida East Coast bridges, about 7000 tons. For the postoffice at the Pennsylvania Terminal in New York the contract will be let next month. For the superstructure estimates run from 8000 to 10,000 tons. The 40-story Woolworth Building, Park Place and Broadway, New York, will require 5000 tons, but bids have not yet been taken.

October has the distinction of bringing out a larger business in foundry iron than any month of the year. The month has also been marked by a progressive decline in prices. In the past week the buying has been well distributed, both as to sections and classes of foundry product. The two leading radiator interests have taken 50,000 to 60,000 tons on this movement, but deliveries go only through the first quarter. Cincinnati reports good sales for the first half, and there has been an increasing sale of \$11 Southern iron for the first quarter of 1911.

Steel making pig iron is weaker. A sale of 5000 tons of basic was made at Buffalo for shipment by water to Chicago. At Cincinnati an inquiry is up for 7500 tons of basic.

Pig iron stocks at furnaces have been growing and merchant producers are probably carrying upward of 1,600,000 tons. Another belated curtailment is under way, and in Alabama, Tennessee, Virginia and Eastern Pennsylvania six or seven furnaces have gone out or will blow out in the next week. The Steel Corporation is banking four of its Youngstown, Ohio, furnaces Saturdays and Sundays.

The export trade in iron and steel has fallen off lately; in the past two weeks the shrinkage in inquiry has been pronounced.

Spot tin at New York has worked slightly below the London equivalent, being the first response to the sharp cutting down of tin plate production.

Steel Rails by the Pound

Steel rails, which, since the beginning of Bessemer rail manufacture in the United States in 1865, have sold at so many dollars a gross ton, are now to be sold by the pound. The change has been under discussion for a year, and the more it was considered the more it commended itself to the manufacturers. But no opportune time was found for putting it into effect until the books of the mills were opened for rail orders for 1911.

The chief reason for establishing rail prices on a pound basis is no doubt to bring them into direct comparison with the prices of other finished products. Heretofore billets and rails, both sold by the gross ton, have been classed together. With most rail producers, not many years back, a deficiency of rail orders meant just so much more steel to be marketed as billets, and it was thus common to compare the prices of the two products. Whenever the rail tariff was up for consideration, or when some Western railroad which hauled little freight to or from steel works sought to break

the rail price, we would hear how the cost of rolling rails was but little more than that of billets. It would be pointed out in reply that such a statement was far from the fact and the case of the rail would be presented in its real light—the severity of the tests, the rigidity of inspection and the cost of rejections. Yet the rail price has always stirred up a certain amount of protest (if we except the prices reached in the steel rail war of 1897 and 1898) and the much quoted letter of a steel master as to the cost of producing rails in the Pittsburgh district has been cited as though it contained the last word on the subject. Over against that letter, it may be said in passing, are the exhibits presented to the Ways and Means Committee nearly two years ago showing that for the five years from 1902 to 1906, inclusive, the lowest average cost of making rails in the United States was \$20.74, while one producer showed an average of \$26.61.

The force of the popular feeling concerning rail manufacture was seen in the reduction of the rail tariff last year from \$7.84 to \$3.92 a ton. But the demands of the railroads for rail quality and for more expensive methods of manufacture have been more and more insistent. As the result of the agitation of 1907 and 1908 specifications have been adopted, as is well known, making the cost of steel rails greater than in years. It is to be considered that rail steel must not only have high resistance to breaking strains, as is required of structural steel, but it must meet the almost equally important requirement of resistance to abrasion. Moreover, limits have been put upon the speed of working rail steel in the mill, and the stringency of tests has been increased, adding to the probability of rejections.

Besides these considerations on the cost side is the fact that the railroads, after using the rail in main track have still the value represented by its use on spurs or sidings, and after that its market value as a relayer for mine or other industrial use; or, when its full capacity for service is utilized by the railroad, there is still left the value of the rail as scrap, which at times has been known to equal or even to exceed the price of new rails.

All these considerations and others have been urged from time to time in justification of the price of steel rails, and there has been in addition the fact that while other products have cut loose in boom times and soared to high levels rails have been kept uniform. At the same time there has been no way of keeping constantly before the buyer of rails the position of this product in relation to other finished forms. The \$28 price for a ton of 2240 lb. figures out exactly 1.25 cents a pound, and that is the price now being quoted for Bessemer rails for 1911 delivery. This price compares to-day with 1.40 cents for bars, plates and structural material; in 1906 and 1907 it would have contrasted with 1.70 cents for plates and structural material. Where premiums have been paid the price for plates, and shapes has at times been near the 2-cent basis. Since the rail specifications of recent years have more and more made steel rails eligible to classification as a highly finished product there is appropriateness in the new departure. In the export trade it may be expected that quotations will continue to follow the traditions since there is no move as yet by foreign manufacturers to follow the lead taken by the United States.

Industrial Switching Railroads

Railroad officials who consider and act upon general questions of policy have had under discussion for some time the status of the industrial railroad which performs switching service for large shipping industries. By a long established custom an allowance of \$2 to \$4 per car is paid to these industrial roads for the switching service which they render, this allowance being paid out of the through rate by the railroad which receives cars from or delivers them to the interchange track of the industrial road. Several cases have been decided by the Interstate Commerce Commission in which it was held that the switching road had no just claim for such allowances. In view of these decisions officials of leading railroad systems are considering the advisability of cutting off all such allowances, except where the industrial railroad can make a case before the commission and force the payment of these switching rates. The proposed action would add an appreciable percentage to the receipts of the railroads from industrial traffic, and would be equivalent to a corresponding advance in rates without inviting the embarrassing discussion that arises when tariff rates are advanced.

Practically all of the large plants which produce iron and steel, with thousands of other individual manufacturing industries, are served by industrial railroads of this character. The question is, therefore, one of general interest among manufacturers, especially since an increase in transportation charges will add somewhat to the cost of production and to market values. The question is one in which the manufacturer is placed at a disadvantage in public discussion, and even before judicial bodies or commissions, on account of the prejudice that has been aroused by many years of agitation of the question of rebates. The Interstate Commerce Commission has in several cases taken the position that it will not interfere when the railroads voluntarily pay nominal rates per car to these switching roads, but it will not enforce payment when the trunk line railroads refuse recognition to the switching roads.

The trend of the decisions by the commission is that the switching road must possess within itself the qualifications of a "common carrier," in order to claim any share of the tariff rate. It must perform service for several industries, or must have stations where freight is received from the public, or in some manner establish legally its position as a common carrier. If it serves only one industry, by which it is owned or controlled, it is a "mere plant facility" which the shipper should maintain at his own expense. There are many cases, especially in the steel industry, where industrial roads owned by shipping corporations are so extensive in their operations that they are recognized by other railroads as common carriers, and would be so recognized by the courts, but in, perhaps, a majority of cases these minor railroads would fall within the commission's definition of a "mere plant facility."

This question is one of many transportation problems in which the theories of legislation do not harmonize with commercial usage or commercial necessity. The interstate commerce law is built up around the theory that a tariff rate is a charge for carrying freight between two points. Fifty years ago a railroad station

was a "point." The ordinary country station still maintains this character of a point, with a freight house and, perhaps, a short team track or switch attached to it. As villages grew into towns and towns into cities, the volume of traffic became too great to be handled at one "point," although this fact is not yet recognized in law. A manufacturer could not receive and ship all his materials and goods by wagon through the station freight house, if his business were of any magnitude. In a large city it would create impossible congestion for all the wagon shippers to receive and ship their freight at one point or freight house. The necessities of the railroad have made it customary to have several freight houses and team tracks in large cities, and it has been a serious problem to increase these facilities as rapidly as the growth of traffic requires.

In the evolution of the railroad the manufacturer has been encouraged to take his business away from the crowded "point" or original station. Industrial tracks have been laid for the use of each plant that is large enough to require this service; the manufacturer loads and unloads his own freight in the cars, and the railroad sends switching engines and crews at stated times to place or "spot" incoming cars at the exact place required for unloading and to take away the loaded cars. The original village "point" has expanded into a great city with hundreds or even thousands of these independent "points" at which freight is received and delivered with no additional charge to the shipper. Except in a few Eastern cities the railroads interchange switching service so that an industry or "point" on the terminals of one road has its cars switched to and from other railroad systems entering the same city, without any charge to the shipper except the through tariff rates. The railroad which performs terminal switching service of this character, without any compensation from the shipper, receives a switching allowance from the road which receives the tariff revenue.

The industrial railroad represents a third step in the evolution of the legal "point." The trunk lines have found that it costs them several dollars per car, at an average, to perform the switching service which is required by large industries. The shipper, on the other hand, has found that he cannot rely upon the service performed by switching crews which come to his plant once or twice a day. He cannot load or unload cars as promptly as necessary, and there is too much delay in correcting mistakes made by an outside crew. The railroad is unable to give him as good service as it gives to the small shipper who only handles a few cars per day.

To overcome this trouble the industrial switching road came into existence. It is regularly incorporated as a railroad, has its own tracks—usually many miles in extent—and its own switching engines and crews, and gives good service because it is under the immediate control of the shipper, usually through ownership of its stock. The cases are rare where these roads earn any profit on their investment, but they facilitate the business of both the industry and the trunk line railroad, and the allowance to the switching road out of the through rate is usually less than what it would cost the trunk line to perform the service itself. The interstate commerce law recognizes the le-

gality of an allowance by the railroad for any service performed by the shipper, and merely gives the commission the power to regulate such allowances, as a check on the payment of rebates through this channel. The railroads have established by their own expert witnesses voluminous records to show the cost of performing switching service, and there can be no moral question of the justice of a reasonable allowance for this service when the shipper performs it, either directly or through the medium of an incorporated industrial railroad. In a recent case decided by the commission the railroads had undertaken to collect a switching charge, in excess of the through rate, for making deliveries of cars on industrial sidings, but it was held that this was unreasonable, and that the tariff "point" embraced legally any industrial points or private sidings within a reasonable distance of the point specified in the rate.

Railroads are profitable only where they control a large movement of industrial freight, moving in carloads. The branch lines or "feeders" that are extended into the country seldom pay expenses, if credited only with their mileage proportion of the rates on the traffic they handle. Instances have been brought into the records in rate litigation where branch roads in agricultural districts do not earn \$1000 per mile, which is less than the average expenditure of railroads for maintaining the track. The profits of the railroads come from the concentration of traffic in trainloads, on trunk lines. The large systems can maintain an extensive mileage of branches, because the loss on the traffic of the branch is covered by the profit in moving the same traffic on the trunk lines. Independent rural railroads, which have no industrial traffic, seldom pay dividends, although they receive average rates per mile for the traffic they move.

Large industries of a character requiring the service of independent switching roads receive and deliver traffic in train loads. They are usually located near trunk lines, so that the traffic they produce passes directly into trunk line movements without any considerable expense. An industry of this character produces as much traffic in a year as 100 or 1,000 miles of branch lines or feeders, which are maintained at a nominal loss by the large systems, in order to control the profitable traffic which is gathered or distributed by the rural lines. The large industry is therefore entitled to unusual consideration. While it should not, on moral grounds, be permitted to ship at lower rates than its small competitor which produces only a car or a few cars of traffic a day, it would seem as though an injustice would be done if the large shipper is compelled to bear a higher cost for the same service than the small shipper.

A Premium System for Traveling Salesmen

An important house manufacturing power equipment has adopted a premium system for its traveling salesmen and believes that the plan is operating with distinct mutual benefits. Each man's income beyond a certain point is regulated by the amount of his sales, which is a condition by no means uncommon, except that in this case the method is different. A standard is established for each man, consisting of the volume of gross sales that the territory should produce under

ordinary conditions, previous experience being taken as the basis. A given cost is determined, comprising salary and the expenses. The profit sharing is fixed by the ratio of the two items of gross sales and the cost of covering the territory. If the latter item should total \$3000 and the basis of sales be \$30,000, the one being 10 per cent. of the other, then the salesman divides with the house 10 per cent. of any amount of sales in excess of \$30,000. Should the total reach \$40,000, he receives one-half of 10 per cent. of \$10,000, or \$500. The stimulus of the usual percentage basis is present, while at the same time the employer is a partner in the gain.

American Capital for Chinese Development

The announcement that American bankers are to finance a loan of \$50,000,000 to China is highly significant. Comment upon it will naturally bring out the seeming anomaly of \$50,000,000 of American money going into China, while an American railroad goes abroad to find buyers for \$10,000,000 worth of notes it has just put out. It may be expected, too, that emphasis will be laid on the considerable amount of the new loan that will find its way to the United States in expenditures for railroad equipment and for the industrial operations the Chinese Government is planning to encourage. In the same connection attention will also be called to the fact that of the \$30,000,000 railroad loan to China which European and American bankers arranged some time ago a portion will doubtless be spent in this country.

There is a larger significance, however, in this Chinese loan, taking the broad view of the uplift in China of which the projected expenditures are but one indication. The growing wants of the Chinese are of great import to the iron trade of the world since they mean a new standard of living among China's hundreds of millions. That means, as it means everywhere, an enlarged consumption of iron and steel. The millions of dollars that are soon to be spent for railroads and industrial development are only a beginning. The awakening in China in the past few years, of which some of the features have been almost startling, represents the beginning of a period of appreciation in all values throughout the Chinese Empire.

It will be many years before China ceases to be the cheapest labor market in the world, or one of the cheapest; but the point is that it is journeying toward higher costs of living. Moreover, an important factor in the new scale of national and individual expense is iron. So much attention is given to the fluctuations that come from year to year in the condition of the iron trade at home that the tendency is to ignore movements in the countries of low iron consumption. China will come far short of the pace at which wants have increased in the United States—making it almost literally true here that many luxuries of the last generation are the necessities of today; but China must be given no small place in any estimates that would measure the growth of the world's demand for iron and steel in the next decade. Chinese production of iron and steel will grow at the same time, it may be assumed, since both ore and coal are available in quantity, but the demand may be expected to develop much more rapidly than the domestic supply.

The Machine Tool Builders

President Fred A. Geier and Secretary Charles Hildreth Re-elected—Closing Session of the Convention Had Features of Exceptional Value

The proceedings of the opening session of the annual convention of the National Machine Tool Builders' Association at the Hotel Astor, New York, on Tuesday, October 25, were given in *The Iron Age* of last week. The proceedings of Wednesday, the final day, comprised the reading of papers and the general discussion following them and the business meeting which elected officers and named Atlantic City for the convention place next spring.

Fred A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, was elected president; C. H. Alvord, Hendey Machine Company, Torrington, Conn., first vice-president; S. H. Reck, Rockford Drilling Machine Company, Rockford, Ill., second vice-president; A. E. Newton, Prentiss Brothers Company, Worcester, Mass., treasurer, and Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., secretary.

The following concerns were admitted to membership, in addition to those mentioned in last week's issue, bringing the growth for the year to 45: Cincinnati Pulley Machinery Company, Covington, Ky.; Milwaukee Machine Tool Company, Milwaukee, Wis.; Wilmarth & Morman Company, Grand Rapids, Mich.; Acme Machinery Company, Cleveland, Ohio; Putnam Machine Company, Fitchburg, Mass.; Bardons & Oliver, Cleveland, Ohio; Willard Machine & Tool Company, Cincinnati, Ohio; Wood Turret Machine Company, Brazil, Ind.; Cleveland Automatic Machine Company, Cleveland, Ohio; Sloan & Chace, Newark, N. J.; Newton Machine Tool Works, Philadelphia, Pa.

The programme of papers was carried out as announced. Frederick L. Eberhardt, Gould & Eberhardt, Newark, N. J., and C. H. Norton, Norton Grinding Company, Worcester, Mass., made interesting addresses in executive session on "Who Should Pay the Expenses of a Representative from the Factory When Sent Out at Request of the Dealer to Help Close a Deal?" Henry Hess, Hess-Bright Company, Philadelphia, Pa., had a very instructive paper on "The Use of Ball or Roller Bearings in Machine Tool Construction," illustrations being distributed among the members that the subject might be most clearly understood. Thomas H. Moore, advertising manager for John Wanamaker, New York, spoke on "Advertising—Large Space in a Few Papers vs. Small Space in a Number of Papers." James N. Heald, Heald Machine Company, Worcester, Mass., had as his topic, "Concrete vs. Wood Flooring," which gave rise to a very interesting discussion as to methods. The important topic, "The Design and Construction of Machine Tools from the User's Standpoint," was discussed by C. K. Lassiter, mechanical superintendent of the American Locomotive Works, and John Riddell, General Electric Company, Schenectady, N. Y.

On Wednesday evening the members and their friends were the guests of the *American Machinist* at a theatre party.

On Thursday the members of the association and many others of prominence in the machinery trade were guests of *Machinery* on an excursion to Sea Cliff, L. I. This was the eighth annual event of the kind arranged by Alex. Luchars. The trip was made on the steamer *Majestic*, and an excellent luncheon was served at the hotel at Sea Cliff. A programme of sports was carried out, including a potato race, a relay race and football and push ball games. The outing was admirably conducted, affording more than 700 ma-

chinery men a chance to renew old acquaintanceship and make new friends.

The New Prices for Steel Rails

As commented on elsewhere, the steel rail manufacturers are now quoting for their product prices per pound instead of per gross ton, but there is no change in the rate. Bessemer rails are now quoted at 1.25 cents per pound, which is exactly the equivalent of \$28 per ton of 2240 lb. For open hearth rails, heretofore \$30 per gross ton, the market price is now 1.34 cents per pound. The old extras are retained. For lots less than 500 tons and more than 20 tons, Bessemer rails are quoted at 1.34 cents (formerly \$30 per gross ton) and open hearth rails at 1.43 cents (formerly \$32 per gross ton). For lots less than 20 tons, Bessemer rails are quoted at 1.43 cents (formerly \$32 per gross ton) and open hearth rails at 1.52 cents (formerly \$34 per ton). Prices per pound will also apply in the case of light rails, or rails weighing less than 50 lb. per yard, these corresponding in the same way as indicated above, to the prevailing prices per gross ton for the respective weights.

The John W. Danforth Company, Buffalo, N. Y., has been awarded contract by the Navy Department for furnishing and installing pumping stations—including pumps, motors and other apparatus, with pipe lines—for pumping oil from large storage tanks to the Government wharves at the naval stations at Bradford, R. I.; Norfolk, Va.; Charleston, S. C., and Key West, Fla. The Navy Department, having adopted the burning of oil on torpedo boats and other vessels, the facilities provided by this contract will enable the boats to fill their tanks with oil from outlets on the wharves. The contract price is over \$85,000, and the work is to be entirely completed in four months. The steam and power pumps and the electrical apparatus for this work are to be furnished by the International Steam Pump Company and the General Electric Company, respectively, through their Buffalo offices.

The Hagstrom Bros. Mfg. Company, Lindsborg, Kan., is distributing glass paper weights of attractive appearance. Attached to the underside of the glass are illustrations of the Hagstrom spark plug and the Hagstrom blow-out, of special interest to the automobile trade.

The Sharon Steel Hoop Company, Sharon, Pa., has closed its branch office heretofore located in the Union Bank Building, Pittsburgh. The purchasing department, formerly located in the Pittsburgh office, has been transferred to the general offices of the company.

The population of Minneapolis, Minn., is 301,408, an increase of 48.7 per cent. The population of Chester, Pa., is 38,537, an increase of 13.4 per cent. The population of the new city of Gary, Ind., is 16,802.

The Liberty Mfg. Company, Susquehanna street, Pittsburgh, manufacturer of steam specialties, has purchased the patents and business of the Pittsburgh Feed-water Heater Company.

The Empire Steel & Iron Company, Catsaqua, Pa., has blown out one of its Crane furnaces and now, out of eight stacks, has but two in blast—one Crane and one Oxford.

The blast furnace of the Central Iron & Coal Company, at Holt, Ala., was blown in October 26 and is now reported producing at its normal rate.

The Ohio Crucible Steel Company, Cleveland, Ohio, is installing one 2-gross-ton special Bessemer converter, which it expects to have ready for operation in November.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 2, 1910.	Oct. 26, 1910.	Oct. 5, 1910.	Nov. 3, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia.....	\$15.75	\$15.75	\$16.00	\$19.00
Foundry No. 2, Southern, Cincinnati.....	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago.....	16.00	16.00	16.25	19.00
Basic, delivered, eastern Pa.....	14.75	15.00	15.00	19.00
Basic, Valley furnace.....	13.00	13.00	13.50	17.25
Bessemer, Pittsburgh.....	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh.....	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago.....	18.00	18.00	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh.....	23.50	23.50	24.00	27.00
Forging billets, Pittsburgh.....	28.50	29.00	29.00	30.00
Open hearth billets, Philadelphia.....	26.00	26.00	26.00	30.60
Wire rods, Pittsburgh.....	28.50	28.50	28.50	32.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago.....	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia.....	13.50	13.75	14.00	18.00
Iron rails, Chicago.....	16.00	16.00	16.00	20.50
Iron rails, Philadelphia.....	18.00	18.00	18.00	21.00
Car wheels, Chicago.....	13.50	14.00	14.00	18.50
Car wheels, Philadelphia.....	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh.....	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago.....	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia.....	13.50	13.75	14.00	18.00

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.....	1.40	1.40	1.40	1.62
Common iron bars, Chicago.....	1.35	1.35	1.35	1.55
Common iron bars, Pittsburgh.....	1.45	1.45	1.45	1.80
Steel bars, tidewater, New York.....	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh.....	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York.....	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh.....	1.40	1.40	1.40	1.50
Beams, tidewater, New York.....	1.56	1.56	1.56	1.66
Beams, Pittsburgh.....	1.40	1.40	1.40	1.50
Angles, tidewater, New York.....	1.56	1.56	1.56	1.66
Angles, Pittsburgh.....	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh.....	1.25	1.30	1.40	1.45
Skelp, sheared steel, Pittsburgh.....	1.35	1.40	1.50	1.55

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh.....	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh.....	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh.....	1.60	1.65	1.65	1.80
Barb wire, galv., Pittsburgh.....	2.00	2.00	2.00	2.10

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	12.87½	12.87½	12.75	13.25
Electrolytic copper, New York.....	12.75	12.80	12.50	12.87½
Spelter, New York.....	5.95	5.60	5.60	6.30
Spelter, St. Louis.....	5.80	5.45	5.45	6.10
Lead, New York.....	4.40	4.40	4.40	4.40
Lead, St. Louis.....	4.27½	4.27½	4.27½	4.25
Tin, New York.....	36.80	36.15	36.50	30.40
Antimony, Hallett, New York.....	7.75	7.75	7.87½	8.25
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York.....	\$3.84	\$3.84	\$3.84	\$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; tees, 3 in. and up, 1.40c. to

1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; Nos. 29, 2.25c.; No. 30, 2.25c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized sheets, No. 28, \$2.75 per square for 2½ in. corrugations. All above prices are f.o.b., Pittsburgh, terms 30 days net or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Butt Weld.		Steel.		Iron.	
	Black.	Galv.	Black.	Galv.	Black.	Galv.
1/8, 3/8, 1/2 in.....	72	58	68	54		
5/8 in.....	75	63	71	59		
3/4 to 1 1/2 in.....	79	69	75	65		
2 to 3 in.....	80	70	76	66		
Lap Weld.						
2 in.....	76	66	72	62		
2 1/2 to 4 in.....	78	68	74	64		
4 1/2 to 6 in.....	77	67	73	63		
7 to 12 in.....	75	59	71	55		
13 to 15 in.....	51½					
Butt Weld, extra strong, plain ends, card weights.						
1/8, 3/8, 1/2 in.....	69	59	65	55		
5/8 in.....	74	68	70	64		
3/4 to 1 1/2 in.....	78	72	74	68		
2 to 3 in.....	79	73	75	69		
Lap Weld, extra strong, plain ends, card weight.						
2 in.....	75	69	71	65		
2 1/2 to 4 in.....	77	71	73	67		
4 1/2 to 6 in.....	76	70	72	66		
7 to 8 in.....	69	59	65	55		
9 to 12 in.....	64	54	60	50		
Butt Weld, double extra strong, plain ends, card weight.						
1/8 in.....	64	58	60	54		
3/4 to 1 1/2 in.....	67	61	63	57		
2 to 3 in.....	69	63	65	59		
Lap Weld, double extra strong, plain ends, card weight.						
2 in.....	65	59	61	55		
2 1/2 to 4 in.....	67	61	63	57		
4 1/2 to 6 in.....	66	60	62	56		
7 to 8 in.....	59	49	55	45		

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½ in. Butt Weld { Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in. Lap Weld {
The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	40	43
1½ to 2½ in.	61	43
2½ in.	63	48
2½ to 5 in.	69	55
5 to 13 in.	61	43
2½ in. and smaller, over 18 ft., 10 per cent. net extra.		
2½ in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c. base; cone head boiler rivets, ¾-in. and larger, 2c. base; ½-in. and 11-16 in. take an advance of 15c., and ½-in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 2, 1910.—(By Telegraph.)

Pig Iron.—On Friday, October 28, bids went in on the inquiry of the Westinghouse Air Brake Company for 1000 tons or more of malleable Bessemer and gray forge iron for delivery in first quarter and first half of next year, but the business has not yet been closed. The Union Steel Casting Company of this city has bought 1500 tons of standard Bessemer iron, deliveries 250 tons a month over first half, at \$15, Valley furnace. The inquiry for pig iron is light, and the market continues weak. We quote standard Bessemer iron for forward delivery at \$15; malleable Bessemer, \$13.75; No. 2 foundry, \$14; basic, \$13, and gray forge, \$13.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Steel.—The market is very quiet and prices are weak. Not enough business is being offered in billets or bars to fairly test prices, but several consumers of sheet and tin plate bars have inquiries out for their requirements for first quarter. We quote Bessemer and open hearth billets at \$23.50 to \$24; Bessemer and open hearth sheet and tin plate bars, \$24.50 to \$25, and forging billets \$28.50 to \$29, all f.o.b. cars, Pittsburgh, Youngstown, or Wheeling district.

(By Mail.)

After the election on Tuesday next is now named by the sanguine element as the time when the long deferred improvement in the iron trade may be expected. No definite reasons are given for this belief and there is nothing tangible in the situation that would seem to indicate early betterment. The railroads are not buying a pound of iron or steel they can possibly avoid, and consumers generally continue to place orders only for such material as they absolutely need. It is a fact, however, that several of the leading railroads, including the Pennsylvania, have made up their estimates for track material needed for the first half of next year and some orders for rails, though probably not very large ones, will likely be placed in the near future. The rail makers have adopted a new method of quoting on rails, all quotations now being on a pound basis, but this does not affect the price of standard sections, which still figure out \$28 per gross ton. The inquiry for pig iron continues light and the market is weak. Some furnaces are willing to sell through first quarter of next year at present prices. The steel market continues weak, Bessemer billets being freely offered at \$23.50 and open hearth sheet and tin bars at \$24.50. The sheet mills are entering a good deal of new tonnage, most of it at the prices recently adopted, which are based on 2.20c. for No. 28 black, but in some cases prices are shaded about \$1 a ton. The amount of new business in iron and steel entered in October by the leading makers compares favorably with September, but at the same time was a

disappointment, not being as large as expected. Low prices continue to rule on coke and scrap.

Ferromanganese.—A leading consumer in the Youngstown district is reported to have bought 2500 tons of foreign 80 per cent., for all of 1911 delivery, at a price slightly under \$39, Baltimore. There is some inquiry out for first half shipment. We quote 80 per cent. foreign at \$38.50 to \$39, Baltimore, the freight rate for delivery in the Pittsburgh district being \$1.95 a ton.

Ferrosilicon.—This material continues somewhat scarce for spot shipment, for which higher prices are offered than for forward delivery. We quote 50 per cent. ferrosilicon for delivery over the next four or five months at \$54.50 to \$55, Pittsburgh, while for prompt delivery a premium of \$1 a ton or more is asked. We quote 10 per cent. blast furnace silicon at \$23; 11 per cent., \$24; 12 per cent., \$25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—The low prices ruling on both iron and steel skelp have brought out some new business, and we note sales of 4000 to 5000 tons of grooved steel skelp at 1.25c., delivered at buyer's mill in the Pittsburgh district, and 500 tons of sheared iron skelp at 1.70c. for same delivery. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumer's mill in the Pittsburgh district.

Rods.—The inquiry for both Bessemer and open hearth rods is light and confined to small lots for early delivery. We quote Bessemer, open hearth and chain rods at \$28.50, Pittsburgh, but Bessemer rods are not so firmly held as open hearth.

Muck Bar.—Consumers are now pretty well covered for the remainder of this year and into first quarter. We quote best grades of muck bar, made from all pig iron, at \$30 to \$30.50, Pittsburgh. Eastern muck bar continues to be offered in this market at \$29 to \$29.50, but we do not hear of much being sold.

Steel Rails.—The rail makers have adopted the method of quoting prices per pound instead of per ton on both standard and light sections. In the case of standard sections this does not make any change in price, as they are quoted at 14c. per pound, which figures \$28 per gross ton at mill, the same price that has been in effect for some years. Last week the Carnegie Steel Company received new orders and specifications against contracts for about 2500 tons of light rails.

Structural Material.—A fair amount of new inquiry is coming out, but no large contracts are being placed in this district. The McClintic-Marshall Construction Company has taken material for the Cortlandt street ferryhouse of the Pennsylvania Railroad at Jersey City, 1700 tons, and also the steel for the new Press Building in this city, about 400 tons. Prices are being maintained on the basis of 1.40c. for beams and channels up to 15 in., f.o.b., Pittsburgh.

Plates.—A few scattering car orders have been placed, but these have been greatly magnified in the daily press. The Pennsylvania Railroad will build 500 freight cars in its own shops at Altoona, and the Norfolk & Western 300 in its shops at Roanoke, Va. Reports are current that the Hawley interests are in the market for 4200 cars of various types, but this inquiry came out nearly six months ago. Reports are also circulating that the Pennsylvania Railroad will buy a large number of cars, but the steel car builders here have not received the inquiry. New business in plates continues light and none of the mills is able to operate to more than 50 or 60 per cent. of capacity. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Sheets.—A good deal of new tonnage has been placed in the past two or three weeks, and most of the leading makers are now operating their plants to larger capacity than for some time. Reports received from four or five of the leading sheet mills in the Pittsburgh and Youngstown districts show that they are running about full, and the same is true of two or three plants in the Wheeling district. In some cases prices are shaded about \$1 a ton. The full schedule of prices on black and galvanized and roofing sheets is printed on a previous page.

Tin Plate.—The tin plate trade has slowed down a good deal recently and leading makers are commencing to curtail output materially. The eight hot mills in the Laughlin plant at Wheeling have closed, and it is probable that operations will be further curtailed during the next week or two by both the leading interest and independents. This is always the dull season in the tin plate trade, and as contracts have been pretty well cleaned up the slowing down in new demand is a natural result. Prices remain firm and we quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh.

Bars.—Little new business is being placed in either

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iron or steel bars, but specifications against contracts are coming in at a fairly satisfactory rate. The demand for iron bars has been dull for some months, the railroads not placing new business and in many cases holding up specifications against contracts. The local market on steel bars is 1.40c., but for some points of delivery, notably in the Chicago district, this is being shaded as a basing price. We quote soft steel bars at 1.40c. in large lots and common iron bars at about 1.45c., Pittsburgh. Prices on the latter are weak.

Hoops and Bands.—New orders are only fair and mostly for small lots, while specifications are coming in quite freely. Prices are firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Cotton Ties.—We quote cotton ties for November delivery at 77½c. per bundle.

Spikes.—New business continues light, the railroads buying only small lots for needed repair work. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a fair amount of new business and specifications against contracts are not at a very satisfactory rate. Prices continue to be shaded.

Shafting.—New orders continue light and specifications against contracts are not coming in at a satisfactory rate. Prices are fairly well sustained. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The demand for wire nails and wire is holding up quite well, but consumers still pursue the policy of largely placing orders only to cover actual needs. Specifications against contracts are reported as quite active, and the leading wire interests advise that their plants are being operated to nearly full capacity. Barb wire and fence wire are dull, as the season is about over, and conditions will be quiet until spring trade opens up next year. We quote galvanized barb wire at \$2; painted, \$1.70; annealed fence wire, \$1.50; galvanized, \$1.80; wire nails, \$1.70, and cut nails, \$1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—A good deal of new inquiry is out for small gas and oil lines, but no large contracts are in the market and probably will not be until early next year. The Ohio Fuel Supply Company has placed contracts for four miles of 6 in. and one mile of 4 in. for delivery in the West Virginia district and two miles of 6 in. for delivery in Ohio. It is stated that discounts on both iron and steel pipe are being maintained.

Boiler Tubes.—The market on boiler tubes is in very unsatisfactory shape, the demand being dull and prices are more or less demoralized.

Iron and Steel Scrap.—Inquiries from consumers are light, and no improvement in demand or in prices is expected until there has been some betterment in the pig iron market. There is not a great deal of scrap pressing on the market to find customers, and while prices are very low they are fairly strong. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.....	\$14.25 to \$14.50
No. 1 foundry cast.....	13.75 to 14.00
No. 2 foundry cast.....	12.75 to 13.00
Bundled sheet scrap, at point of shipment.....	10.00 to 10.25
Revolving rails, Newark and Cambridge, Ohio, and Cumberland, Md.....	15.75 to 16.00
No. 1 railroad malleable scrap.....	13.50 to 13.75
Grate bars.....	12.00 to 12.25
Low phosphorus melting stock.....	17.50 to 17.75
Iron car axles.....	24.50 to 24.75
Steel car axles.....	21.25 to 21.50
Locomotive axles.....	24.50 to 25.00
No. 1 busheling scrap.....	12.50 to 12.75
No. 2 busheling scrap.....	8.50 to 8.75
Old car wheels.....	14.25 to 14.75
Sheet bar scrap ends.....	15.75 to 16.00
Cast iron borings.....	8.00 to 8.25
Machine shop turnings.....	8.50 to 8.75
Old iron rails.....	16.00 to 16.25
No. 1 wrought scrap.....	15.00 to 15.25
Stove plate.....	11.75 to 12.00
Heavy steel axle turnings.....	9.75 to 10.00

Coke.—No large new inquiries for blast furnace or foundry coke have come in the market in the past week, aside from one from a Cleveland furnace interest, which bought 1500 tons for November delivery at \$1.55, at oven. The output of coke in the Upper and Lower Connellsville regions

last week was 351,085 tons, about the same as the previous week. It may be noted that this is fully 100,000 tons less than in the early part of this year, but there is still too much coke being made. The Sunshine Coal & Coke Company, Uniontown, Pa., operating coal mines and coke works in Fayette and Westmoreland counties, reports that it has closed with several blast furnace operators for their entire supply of coke for 1911 and 1912, prices being somewhat higher than are being quoted at this time, owing to the long deliveries ahead. These contracts aggregate about 20,000 tons a month.

Chicago

FISHER BUILDING, November 2, 1910.—(By Telegraph.)

Developments in the market tend to confirm the information given in this correspondence two weeks ago that the most serious political difficulties of the railroads have been settled. The railroads are buying more freely and there are indications that their purchases will be on a more extensive scale in the very near future. Two roads have recently bought 1500 tons of bar iron instead of the small orders that have been given heretofore. One road has ordered 400 tons of plates from store for car repair work, and the equipment companies are showing more confidence in the future. Plans are under consideration to double a car building plant in the Chicago district. Data have been compiled by the railroads for rail orders for next year, amounting to 500,000 tons, although definite inquiries have not yet been submitted to the mills. High officials of the railroads are quoted in private advices as stating that their purchases in the coming year will surpass all former records of railroad activity in the iron and steel market. It is understood that all contracts placed will contain a cancellation clause. The policy of restricting purchases which has been followed the past four months does not seem to have had any considerable effect and it is understood that during the next three months the opposite plan will be followed of heavy buying, subject to cancellation. In the immediate future this will enable the roads to replenish their stocks of materials and bring their equipment into better shape. Outside of railroad purchasing the market shows satisfactory progress. Buying from store, which dropped off during the fall, shows a marked increase. The sheet market is strong and the wire mills in this district are running full. Specifications for bars and merchant steel are satisfactory and there is a little more structural business. Among other items, the steel order for the Heisen Building in Chicago, which was placed last summer, has been increased to about 8000 tons, the steel being fabricated on a separate contract for this building. The scrap market is restless and shows more activity, but large stocks which have accumulated the past fall act as a check on any advancing tendency in prices.

Pig Iron.—A very satisfactory buying movement is the progress in this territory. There are inquiries pending of a definite character for fully 50,000 tons of Northern iron, of which about 10,000 tons are for November and December shipment and the remainder for first quarter or first half. One large buyer is in the market for about 24,000 tons of various grades of Northern iron and 10 or 12 gray iron foundries in Chicago and surrounding territory are inquiring for 1000 to 2000 tons each. The inquiries pending include about 5000 tons of charcoal iron. The inquiries now in the market are of a more definite character than heretofore and a fair amount of business has been closed. The inquiry for Southern iron has also broadened considerably and many orders have been booked for small lots of 100 to 500 tons as well as several orders of 1000 to 2000 tons each of Alabama iron for first quarter. Most of the plow manufacturers are in the market for quantities that will partially cover their requirements for the first half and there are good inquiries from other manufacturers and from jobbing foundries. The business done in the past 10 days in small lots has been so extensive that it makes a good showing for the month of October on the books of many of Chicago offices. Buyers are generally paying \$11.50 for Alabama iron for the first quarter and there is less pressure to sell for prompt shipment. Only a few furnaces, principally in Tennessee territory, are accepting prompt orders at \$11. The market shows considerable vitality in view of the large accumulation of stocks. Advices in this market indicate that the furnace stocks in Alabama amount to something over 250,000 tons and Tennessee furnaces have about 50,000 tons; southern Ohio stocks are estimated at 175,000; Toledo and Cleveland districts, 100,000; the Valleys, 250,000, including basic and Bessemer; Chicago and Milwaukee territory, 100,000; Lake Superior charcoal, over 100,000; eastern Pennsylvania, 90,000; Virginia, 200,000. The accumulation of furnace stocks on all the markets is holding prices at a low level, but stocks are relatively small compared with the annual consumption of merchant iron. The following

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quotations are for November and December shipment, Chicago delivery:

Lake Superior charcoal.....	\$18.00 to \$18.50
Northern coke foundry, No. 1.....	16.50 to 17.00
Northern coke foundry, No. 2.....	16.00 to 16.50
Northern coke foundry, No. 3.....	15.75 to 16.00
Northern Scotch, No. 1.....	17.00 to 17.50
Southern coke, No. 1.....	15.85 to 16.35
Southern coke, No. 2.....	15.35 to 15.85
Southern coke, No. 3.....	15.10 to 15.60
Southern coke, No. 4.....	14.85 to 15.35
Southern coke, No. 1 soft.....	15.85 to 16.35
Southern coke, No. 2 soft.....	15.35 to 15.85
Southern gray forge.....	14.60 to 15.10
Southern mottled.....	14.60 to 15.10
Malleable Bessemer.....	16.00 to 16.50
Standard Bessemer.....	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%.....	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%.....	21.40 to 21.90

(By Mail.)

Billets.—The market is quoted at \$28, Chicago, for forging billets, although in some cases this price has been shaded.

Rails and Track Supplies.—There are two definite inquiries in the market for round lots of rails for roads in Southeastern territory, but the business is not reported closed. Estimates have been prepared by railroad engineers covering requirements for next year, which amount to over 500,000 tons, but this business has not yet taken the form of definite inquiry. The trade in track supplies is now between seasons, as buying for this year is about over and contracts have not been placed for 1911 shipment. It is understood that a very large tonnage of rails purchased by some Western roads on which deliveries have been made has not been laid in tracks this year. These railroads purchased heavy rails for their main lines, intending to take up the lighter sections in use and utilize them for branches and extensions. On account of political agitation and trouble over the general advance in rates construction work of this character was stopped last summer and cannot be resumed now until spring. For this reason such roads may defer their yearly rail contracts for several months. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$26; 30 to 35 lb., \$26.75; 16, 20 and 25 lb., \$27; 12-lb., \$28, Chicago.

Structural Material.—The mills are getting more orders for the plain material than a week or two ago and there is a better feeling in the trade. The price of 1.35c., Pittsburgh, is still reported on light material, but the greater part of the business is being placed on the basis of 1.40c. There was also an improvement last week in the number of building contracts let in Western territory. In Chicago an addition to the Presbyterian Hospital, 330 tons, was booked by Vierling, McDowell & Co. In Omaha a power plant, 480 tons, was let to the Paxton-Vierling Iron Works. At Denver the Schuberts theatre, 500 tons, was let to the Loweth Brothers of that city. At Dallas, Texas, the Wilson Building, 800 tons, was let to Schreiber & Sons, Cincinnati. At San Francisco, the Cortez Hotel, 1000 tons, Bethlehem shapes went to Millikins Brothers. In Chicago bids are being taken on a 1600-ton loft building at Fifth avenue and Polk street, Bethlehem shapes specified, which will be erected by the Marshall Field Estate. The Oregon Trunk Line is in the market for 2000 tons of bridges for that company's new road in Oregon. The Anaheim Sugar Company, Anaheim, Cal., has let a contract for 145 tons, for factory additions, to the Des Moines Bridge & Iron Works. The Chicago, Milwaukee & St. Paul has ordered from the American Bridge Company, 125 tons of rods for a Howe truss (timber) bridge. The Monon has ordered 140 tons of bridge work from the Wisconsin Bridge Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Although plate business is one of the quietest branches of the market the Illinois Steel Company continues to receive enough specifications to keep its mill in regular operation. Eastern mills are reported making concessions in prices on plates up to 80 in. wide, but the leading companies continue to hold at 1.40c., Pittsburgh. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The sheet market continues to show steady improvement and the volume of new business is more satisfactory than in any other branch of the trade excepting possibly wire products. The open recognition of the prices now quoted and the adoption of the new differentials on galvanized sheets seem to have had a steadying effect on the market. Jobbers and manufacturing consumers of sheets have been disposed for a long time to purchase only for prompt shipment on account of the trend of the market, but there is either a marked increase in consumption recently or more confidence among buyers. Based on the price

of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged, No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Specifications on agricultural contracts are very satisfactory and in some directions there is improvement in the amount of new business. Reports continue of the price of 1.35c., Pittsburgh, on soft steel bars, but only on desirable orders and from mills which do not hold annual contracts on which prices are guaranteed against a decline. There is a little improvement in the current demand for bar iron and there has been a fairly steady demand from contractors for concrete bars. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The wire mills in the Chicago district, which supply the greater part of the Western trade, are reported running practically full. The weather has been very favorable for fall trade in fence and this is keeping up the demand for barb wire, fence wire and field fence. The manufacturing demand is on a normal basis. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The mills report that specifications and new orders for merchant steel were better during October than in September. Shipments were a little less during October, a natural movement, owing to the fact that the heavy summer shipments go into agricultural implements for the fall trade. Orders from store for all kinds of merchant steel have shown a remarkable increase in the past 10 days. The last week in the month is usually a light one in store orders, but there was unusual activity in this trade last week. The railroads are conspicuous in purchases from stock, as their purchasing departments have been held under such restrictions the past summer that they no longer have time to obtain mill shipments. On a recent order for 400 tons of plates for car repair work it was necessary to purchase from store so as to obtain immediate shipment.

Cast Iron Pipe.—Detroit, Mich., advertised recently for 6300 tons of water pipe, but all bids were rejected and it is not known here whether the business will be readvertised or placed with a Detroit foundry. No other large specifications are reported in the market. The leading pipe interest booked several small lettings last week amounting to about 1500 tons. The season for laying pipe is about over in the North, and interest from now on will center in contracts for winter shipment. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$27; 6 to 12 in., \$26; 16-in. and up, \$25, with \$1 extra for gas pipe.

Old Material.—There are indications of restlessness in the scrap market after a long period of stagnation. The prices being paid by consumers are no higher, but dealers find it easier to dispose of their material and there is a strong undercurrent in the market growing out of the prospect of an early buying movement on the part of the railroads in the market for finished material. A manufacturer at Racine has purchased 1000 tons of cast scrap and there have been several other transactions running into round lots. The leading rolling mill interest has been buying wrought scrap recently and a new steel interest has made purchases of low phosphorus steel scrap. Dealers are finding it a little more difficult to dispose of rerolling rails, as the mills have picked up large stocks this fall and are not active buyers. Any advancing tendency in the market will be held in check for some time by the fact that stocks have been accumulating. Many of the dealers have taken in large stocks of material at their yards in the past two or three months and most of the buyers in this market are also carrying good stocks. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to \$1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$16.00 to \$16.50
Old steel rails, rerolling.....	15.25 to 15.75
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, sub- ject to inspection.....	24.00 to 25.00
Old car wheels.....	13.50 to 14.00
Heavy melting steel scrap.....	12.25 to 12.75
Frogs, switches and guards, cut apart.....	12.25 to 12.75
Shoveling steel.....	11.75 to 12.25

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The following quotations are per net ton:

Iron angles and splice bars.....	\$14.00 to \$14.50
Iron car axles.....	19.50 to 20.00
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	11.75 to 12.25
No. 2 railroad wrought.....	10.75 to 11.25
Springs, knuckles and couplers.....	11.50 to 12.00
Locomotive tires, smooth.....	17.00 to 17.50
No. 1 dealers' forge.....	10.50 to 11.00
Steel axle turnings.....	8.25 to 8.75
Machine shop turnings.....	7.00 to 7.50
Cast and mixed borings.....	4.75 to 5.25
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings.....	8.50 to 9.00
Boiler punchings.....	14.00 to 14.50
No. 1 cast scrap.....	12.50 to 13.00
Stove plate and light cast scrap.....	10.75 to 11.25
Railroad malleable.....	11.00 to 11.50
Agricultural malleable.....	10.50 to 11.00
Pipes and flues.....	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 1, 1910.

The first move toward curtailment of pig iron production in this territory developed during the week, the basic makers taking the initiative. One Lehigh Valley stack went out and one Schuylkill Valley furnace will be blown out this week, while several others are expected to follow in the near future. The market shows little change, transactions being closely confined to the foundry grades. While there is the same expectant feeling that a better market is in sight, buying lacks snap. There has been a trifle better inquiry for some classes of finished products, plates particularly showing up more strongly, although immediate orders are light. The report current that a large buyer in this territory had succeeded in breaking the price for heavy plates is denied by the supposed purchaser, who claims that the order has not been placed. Inquiries for steel rails from some of the large Eastern roads for next year's requirements are expected almost any day. No movement is reported in steel billets, prices of which could be shaded for tonnage. Both iron and steel bars have been dull. A waiting market with lower quotations is noted for old material.

Iron Ore.—Some interest is shown in the outcome of the deliberation on lake ore prices for next year now under way. There has been no inquiry for ores. Importations at this port for the week ending October 29 aggregated 12,950 tons, valued at \$35,131. The largest single cargo of iron ore ever received at this port came in Saturday, the steamship Sir Ernest Cassel arriving from Narvik, Sweden, with 9800 tons of Swedish ore. The classification of importations at this port in September is as follows: Spanish and Mediterranean, 40,237 tons; Cuban, 32,200 tons; Newfoundland, 17,825 tons; Swedish, 6454 tons. September importations of Cuban ore at the port of Baltimore aggregated 83,600 tons.

Pig Iron.—There is a very fair volume of inquiry for foundry grades for both prompt and early 1911 delivery, but, outside of the requirements of the cast iron pipe makers, the tonnages being figured on run rather small. No particular betterment in actual sales is reported; in fact, sales during the week probably aggregate less than during the previous one. A Delaware River cast iron pipe foundry, which inquired last week for 5000 tons of analysis iron for early next year, has placed orders for a portion at \$14.70, delivered, for Northern iron. Other pipe foundries in this district are in the market for moderate lots, but so far have only bought some small lots of off grade iron at about \$14.25, delivered. A Virginia pipe maker placed an order with a local furnace for about 2000 tons of low grade Virginia iron for early 1911 delivery and is understood to be figuring on a further purchase. About an even volume of small lot buying for prompt delivery is reported in the higher grades of foundry iron. A stronger disposition to get at least a portion of the first quarter's requirements placed is noted and sales either for prompt or first quarter are made in carloads to a few hundred tons at \$15.75 to \$16, delivered, for standard brands of No. 2 X foundry. There has been a better movement in Virginia foundry iron, but in very few instances will sellers contract for delivery beyond the next three months. The general quotation for No. 2 X foundry, and in the majority of instances also for No. 2 plain, is \$13.25, furnace, although spot lots can in instances be done at \$13. With the most favorable freight rate into this district, the minimum quotation on the former basis is \$16.05, which is about the best that can be done, except for odd spot lots. A little more inquiry for rolling mill forge is reported, quantities ranging up to a few hundred tons, on which quotations range from \$14.50 to \$14.75, delivered. No sales of importance are reported. There is still a lack of interest in the basic market. Sellers' ideas of prices for first quarter and half delivery range from \$15 to \$15.50, delivered, although for prompt iron \$14.75 to \$15 could

readily be done, but outside of the small inquiry recently reported no interest is shown by melters. Little demand for standard low phosphorus iron is reported, although some inquiry for misfit iron is noted. Standard brands are firm at \$22.50, delivered here. The accumulation of stocks and the lack of demand for basic iron have resulted in some producers making curtailments in production. One stack of the Empire Steel & Iron Company at Catasauqua, was blown out last week. One Heckscher, at Swedeland, will go out this week, and one Longdale, in Virginia, was blown out last week; indications point to the blowing out of one or more stacks in the Lehigh Valley district in the near future. Princess Furnace, in Virginia, will be blown out for repairs toward the close of the month, to be idle probably six weeks. These various curtailments will, it is believed, help the situation in this territory to some extent, although the amount of iron on furnace banks has not been heavy enough, as a rule, to influence the market. The following range of prices represents the market for standard brands delivered in buyers' yards in this vicinity, either for shipment during the remainder of the year, and in some instances the first quarter of 1911:

Eastern Pennsylvania, No. 2 X foundry.....	\$15.75 to \$16.00
Eastern Pennsylvania, No. 2 plain.....	15.25 to 15.50
Virginia, No. 2 X foundry.....	16.00 to 16.25
Virginia, No. 2 plain.....	16.00 to 16.25
Gray forge.....	14.50 to 14.75
Basic.....	14.75 to 15.00
Standard low phosphorus.....	22.50

Ferromanganese.—A further scattered small lot inquiry is noted, with one concern in the market for about 500 tons for first half delivery. Prices appear a shade easier, \$38.75 to \$39, Baltimore, about representing the market.

Billets.—The demand is still confined to small prompt lots for early delivery. There have been no inquiries of sufficient size to test the market, but there is little doubt that the present quotation, \$26, delivered, for ordinary open hearth rolling billets, would be shaded 50c. a ton for desirable orders. Forging billets are firm at \$28, Eastern mill, with the usual extras for high carbons and special sizes.

Plates.—There is more inquiry and in some instances mills have had a little better run of small orders. Makers are bidding on some 3000 tons for two merchant ships, while quotations for plates for several torpedo boat destroyers are also being figured on. Reports that an Eastern consumer had placed orders for 2000 tons of tank plates for a gas holder at a sharp concession from recent prices is denied by the supposed purchasers, who state that they are in no haste to place the business. Producers in this district are apparently maintaining pretty firmly the quotation of 1.55c, delivered in this territory.

Structural Material.—No new local propositions of any importance have come out, although fabricators are bidding on some fair-sized work in other districts, and one order, for a power house in Washington, D. C., requiring 900 tons, has been placed. The Union League addition is expected to be closed the current week. The bulk of the recent business has been small and of a miscellaneous character, aggregating a somewhat smaller volume. Prices for plain shapes appear to be firm at 1.55c. minimum, delivered in this territory.

Sheets.—A very fair run of orders, mostly small and for prompt delivery, is reported. In the aggregate these reach a good total, and mills in this district continue fully engaged and report a marked urgency by customers for prompt deliveries. Quotations are well maintained, Eastern makers holding firmly the following range of prices for prompt deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand continues dull. Current orders are small. Prices are fairly well held for the class of business offered, but the market has not been seriously tested. For ordinary specifications refined iron bars are quoted at 1.40c. to 1.45c, delivered in this vicinity. Steel bars have been a shade quieter, with the price firmly held at 1.55c, delivered.

Coke.—Interest is being shown in furnace coke for next year's delivery, but buyers and sellers are slightly apart on ideas as to prices. Producers are holding at \$1.65 to \$1.85, at oven, for forward coke, while consumers' ideas of prices are around \$1.55 to \$1.65. Not much business has been done, but a better volume is anticipated in the near future. There has been a scattered demand for foundry coke, with sales mostly confined to small lots, with prices for established brands ranging from \$2.20 to \$2.40, at oven. The following range of prices, per net ton, about represents the market for delivery in this vicinity:

Connellsville furnace coke.....	\$3.85 to \$4.10
Foundry coke.....	4.40 to 4.75
Mountain furnace coke.....	3.45 to 3.70
Foundry coke.....	4.00 to 4.35

Old Material.—A waiting market characterizes the local situation. Most consumers are well supplied for the near future and make purchases at bargain prices only. One of

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the leading steel mills has purchased 2000 tons of strictly No. 1 heavy melting steel at \$13.75, delivered, but is now out of the market. Other mills offer down to \$13 for this grade, simply as fixing a price, as material is not wanted. Under the circumstances it is difficult to name a market quotation for steel scrap, although \$13.75 is easily the top of the market. Rolling mill grades are inactive and tenders of material, even at the lower quotations named for some grades, fail to arouse the interest of buyers. While to a large extent nominal, the following quotations about represent sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate of 45c. to \$1.35 per gross ton:

No. 1 steel scrap and crops.....	\$13.50 to \$13.75
Old steel rails, rerolling.....	15.50 to 16.00
Low phosphorus.....	19.00 to 19.25
Old steel axles.....	20.00 to 20.50*
Old iron axles.....	26.50 to 27.50*
Old iron rails.....	18.00 to 18.50*
Old car wheels.....	13.50 to 14.00
No. 1 railroad wrought.....	16.00 to 16.50
Wrought iron pipe.....	12.75 to 13.25
No. 1 forge fire.....	11.50 to 12.00
No. 2 light iron.....	7.50 to 8.00
Wrought turnings.....	8.50 to 9.00
Cast borings.....	8.50 to 9.00
Machinery cast.....	14.00 to 14.50
Railroad malleable.....	13.50 to 14.00
Grate bars.....	11.50 to 12.00
Stove plate.....	10.00 to 10.50

* Nominal.

Matthew Addy & Co., pig iron, ore, coal and coke merchants, with offices at 740-741-742 Real Estate Trust Building, Philadelphia, Pa., will remove this week to rooms 409-411 in the same building. S. C. Ludwig, for many years associated with the Alan Wood Iron & Steel Company, Philadelphia, has resigned and is now with the sales department of Matthew Addy & Co.

Cleveland

CLEVELAND, OHIO, November 1, 1910.

Iron Ore.—Shipments continue to fall off and will be very light this month. All the barges of the Pittsburgh Steamship Company will be in port by the end of the week and the steamers of that company are expected to load their last cargoes by November 19. We quote prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—The local market shows more activity than for some time in the volume of inquiries from this territory. While not many sales were reported, and some of the inquiries previously noted are still pending, the general feeling shows an improvement. A Kentucky steel company is in the market for 6500 tons of basic, 1000 tons for delivery in each November and December and 1500 tons per month during the first quarter. There is also a local inquiry for 1000 to 2000 tons of basic for the first half. A local foundry is in the market for 2000 tons of No. 2 foundry for the first half. A Canton foundry has an inquiry out for 500 tons of each Northern and Southern No. 2 for the first half. An Erie, Pa., manufacturer wants 1000 tons of No. 2 foundry for the same delivery, and some smaller inquiries have come from the same locality. A radiator company is asking for prices on 1000 tons of Southern iron for November and December delivery, and a Mansfield stove manufacturer wants 500 tons of No. 2 Southern for the first half. A northern Ohio foundry has an inquiry out for 500 tons of No. 2 Northern for the first half. There is a northern Ohio inquiry for 1500 tons of gray forge for December, January and February delivery. A Canton plant is in the market for 500 tons of charcoal iron for the remainder of the year and an unspecified tonnage for its first half requirements. No change is apparent in the price situation. Sales are being made at \$14, Cleveland and Valley furnace, for first half delivery. For local delivery, after the first of the year, \$14.25 to \$14.50, delivered, are the ruling quotations. Southern iron appears firm, at \$11.50 for the first quarter, but many consumers are still holding out for \$11. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer.....	\$15.90
Northern foundry, No. 1.....	\$14.50 to 15.00
Northern foundry, No. 2.....	14.00 to 14.50
Gray forge.....	14.00 to 14.25
Southern foundry, No. 2.....	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon.....	19.05 to 19.25

Coke.—Some Wise County, Virginia, foundry coke is being sold in this market in competition with the Connells-ville brands. Sales are being made at about \$2, at oven, which is equivalent to about \$2.50, Connells-ville. The Virginia freight rate to Cleveland is \$2.10, as compared with \$1.65 from the Connells-ville region. The market continues quiet in both foundry and furnace grades. We quote standard Connells-ville furnace coke at \$1.55 to \$1.65 per net

ton, at oven, for spot shipment and \$1.70 on contract. Connells-ville 72-hour foundry coke is held at \$2.10 to \$2.25 for spot shipment and \$2.25 to \$2.50 for the remainder of the year and the first half.

Finished Iron and Steel.—Several of the mill agencies report an improvement in the volume of orders and the general situation in this territory is regarded as better. Some manufacturing plants are getting a larger volume of business and are specifying somewhat more freely on contracts. The hesitancy that has prevailed among buyers for several weeks over the placing of orders because of the belief that price reductions might be secured by waiting appears to have about disappeared and orders are being more freely placed for material that is actually needed. The demand for steel bars is holding up well and prices are firmly maintained. Little new bar business is coming out, as consumers are nearly all under contract. Good specifications are coming from the implement trade. The demand for plates, which has been quiet for some time, shows quite an improvement. Some of the boiler and tank shops have been getting some good orders and have placed contracts for the plates required, which have been accompanied with liberal specifications. Plate prices are being firmly maintained except by a few mills making the narrow sizes. There has been some inquiry for plate contracts for the first quarter, and some of the mills will probably soon begin to take on tonnage for that delivery at current prices. The demand for small lots of structural material is fairly active, but no new work requiring round tonnages is coming out. Prices are being firmly maintained at 1.40c., Pittsburgh. The demand for sheets continues quite active. Prices on galvanized sheets are firm, but there are reports that in some cases black sheets are being shaded \$1 a ton. The demand for iron bars is a little more active, some good specifications having come from railroads for repair work. We quote iron bars at 1.30c., at mill, but this price is being shaded slightly.

Old Material.—A better feeling has developed among some of the dealers during the week and they are holding for higher prices than are prevailing. Others declare that there is no foundation for a firmer tone in the market. The demand continues light, mills buying only in small lots. Heavy melting steel and busheling scrap show more activity than other grades. The Erie and Wheeling & Lake Erie railroads received bids November 1 on lists containing indefinite tonnages. An obvious error appeared in this report September 22 and later issues, prices in the first section of the list being stated as per net ton. This should have read per gross ton. Prices are steady and unchanged. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$14.00 to \$14.50
Old iron rails.....	16.00 to 16.50
Steel car axles.....	20.00 to 20.50
Heavy melting steel.....	13.00 to 13.25
Old car wheels.....	14.00 to 14.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	12.00 to 12.50
Railroad malleable.....	13.00 to 13.50
Light bundled sheet scrap.....	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	5.50 to 6.00
Iron and steel turnings and drillings.....	6.25 to 6.50
Steel axle turnings.....	8.75 to 9.00
No. 1 busheling.....	11.00 to 11.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 cast.....	11.50 to 12.00
Stove plate.....	10.50 to 11.00
Bundled tin scrap.....	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., October 31, 1910.

Pig Iron.—While the inquiry the past week has been very large—much larger, in fact, than for some weeks—yet the volume of business actually booked by Southern producers was far from satisfactory. Such buying as was recorded was at the expense of the price schedule that has been nominally quoted now for some weeks. The bulk of the tonnage placed was on a basis of \$11, Birmingham, and the deliveries are practically all limited to the next 90 days. Pipe makers continue to take small tonnages of certain grades when they can be had at a concession. It is generally conceded that \$11 is the absolute bottom for Birmingham iron, and it is thought that if such a figure were made general for delivery over the first half of 1911 heavy buying would immediately result. The large volume of inquiry recently tends to confirm this belief, but it is doubtful if many producers in the South can well afford to sell for any extended delivery at such a figure. Meanwhile the bulk of the business that is being placed in the pig iron line goes to the furnaces North or to the stacks in Tennessee that are willing to give away part of their freight differential as compared with Birmingham. It is estimated that October will show about an even break as to production and shipments, so that stocks on hand November 1 will likely vary

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little from the record for October 1. This in itself is an item of considerable encouragement to producers. There are numerous predictions of car shortage during the coming winter months; already there is a great scarcity of coal cars for moving Alabama coal to new fields where a demand has sprung up by reason of the summer strikes in other coal fields.

Cast Iron Pipe.—No bookings of consequence are reported by the Alabama pipe makers for the week just closed. Shipments continue at about the same rate as for some months. Quotations remain at about the following schedule for water pipe, per net ton, f.o.b. cars at foundries this immediate district: 4 to 6 in., \$22; 8 to 12 in., \$21; over 12-in., \$20, gas pipe taking the usual differential of \$1 per ton higher.

Old Material.—Listlessness still pervades the scrap market, with quotations nominally as follows:

Old iron axes.....	\$15.00 to \$15.50
Old iron rails.....	13.00 to 13.50
Old steel axes.....	14.50 to 15.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	9.00 to 9.50
No. 1 country.....	8.00 to 8.50
No. 2 country.....	7.50 to 8.00
No. 1 machinery.....	9.50 to 10.00
No. 1 steel.....	11.50 to 12.00
Tram car wheels.....	9.50 to 10.00
Standard car wheels.....	10.50 to 11.00
Light cast and stove plate.....	8.00 to 8.50

Cincinnati

CINCINNATI, OHIO, November 2, 1910.—(By Telegraph.)

Pig Iron.—Increasing sales and inquiries improve the situation with local agencies. A Cincinnati foundry has contracted for 700 tons of Northern and 800 tons of Southern No. 2 foundry. A southern Ohio firm bought 1500 tons of Northern foundry and an Indianapolis melter signed for a good sized tonnage of both Northern and Southern foundry, all deliveries for the first half of next year. A number of other orders, ranging from 50 to 300 tons, have been booked for this same delivery. Taking everything into consideration, the outlook continues to grow encouraging, but prices remain at the previously reported low level. Southern foundry can be purchased at \$11, Birmingham basis, for this year and delivery extended into the first quarter of next at the same figure, although the regular quoted price is \$11.50 for shipment extending through the first half. Northern iron does not seem to be able to get above \$14, Iron-ton, for this year and contracts with some interests could probably be made at this same figure for shipment until April next, although \$14.50 is the quoted price for first half contracts. A noticeable feature of the present market is that in actual sales made the difference in price between the regular standard foundry and lower grades does not appear to have been maintained. A local inquiry for 7500 tons of steel-making iron for delivery extending through the first quarter is expected to be closed soon and another for 1200 tons of Northern foundry from a nearby concern will also doubtless be closed before next week. The weekly letter of Matthew Addy & Co. says: "One of the interesting sales of the week was to a large foundry that tried in vain to buy at present prices for delivery over the second quarter of next year. Finally, finding that no furnace would make such a contract, it bought iron to be placed in storage in November and December, to be paid for promptly, but the furnace to carry free of storage charges for nine months. In this way the foundry makes sure next year of cheap iron, for the interest charges which will accrue before the iron is melted will be cheap insurance against an advance in the market." For immediate delivery and for the remainder of the year, based on freight rates of \$3.25 from Birmingham and \$1.20 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$14.75 to \$15.25
Southern coke, No. 2 foundry.....	14.25 to 14.75
Southern coke, No. 3 foundry.....	13.75 to 14.25
Southern coke, No. 4 foundry.....	13.50 to 14.00
Southern coke, No. 1 soft.....	14.75 to 15.25
Southern coke, No. 2 soft.....	14.25 to 14.75
Southern gray forge.....	13.50 to 14.00
Ohio silvery, 8 per cent. silicon.....	19.20 to 19.70
Lake Superior coke, No. 1.....	16.20 to 16.70
Lake Superior coke, No. 2.....	15.70 to 16.20
Lake Superior coke, No. 3.....	15.20 to 15.70
Standard Southern car wheel.....	25.25 to 25.75
Lake Superior car wheel.....	22.25 to 22.75

Coke.—For November-December shipment a small amount of Connellsville furnace coke has been bought, and the usual number of small foundry coke orders have been received the past week. Furnace coke is quoted in all three fields at \$1.65 to \$1.85 per net ton, at oven, but spot shipment of some of the lower grades would shade the first named figure. The average contract price of \$2.25 for foundry coke is the same in the Wise County, Pocahontas and Connellsville districts. For immediate shipment \$2 can be done on some grades.

Coal.—A serious car shortage is in sight, and one large interest has been forced to cut down the output of its mines over 40 per cent., as it has no cars in which to ship its product. A large number of the cars furnished are also claimed to be in very bad condition and delays en route for repairs are frequent. Pocahontas lump and egg coal is quoted at \$2.25; standard splint lump at \$1.85 to \$2; run-of-mine at \$1 to \$1.25, and slack around 90c. at mines. The demand is good for all grades, except slack, but prompt deliveries are hard to make on account of the car shortage, which is certain to be worse when cold weather begins.

Finished Iron and Steel.—There is no change in the quiet conditions that have prevailed for the past few weeks. New contracts are scarce and mill agencies do not look for any immediate improvement. Agricultural implement material has furnished a better tonnage than any other class of orders. The warehouse price on structural material is about 1.90c. and that of steel bars, 1.80c.

Old Material.—Local dealers continue to report only small sales to fill immediate requirements of foundries. Only light tonnages are being bought by dealers. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton.....	\$12.50 to \$13.00
Cast borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	6.00 to 7.00
No. 1 cast scrap, net ton.....	11.50 to 12.50
Burnt scrap, net ton.....	8.00 to 9.00
Old iron axes, net ton.....	17.50 to 18.50
Old iron rails, gross ton.....	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton.....	22.50 to 23.50
Old car wheels, gross ton.....	12.00 to 13.00
Heavy melting steel scrap, gross ton.....	12.00 to 12.50

Buffalo

BUFFALO, N. Y., November 1, 1910.

Pig Iron.—Inquiry is keeping up well, both for current quarter and 1911 deliveries. Consumers manifest a fairly good buying interest, although sales for the past week have not been as heavy as the preceding week. The orders coming in have, as a rule, been for smaller quantities. The larger portion of new business was for foundry grades, but some malleable was included and one 5000-ton order for basic from a Chicago steel company, for delivery before the close of navigation at current quarter price. Prices for most grades are showing a slightly stronger tendency, furnaces in this district not exhibiting any eagerness to secure 1911 business at going prices and not attempting to meet the extremely low delivered prices quoted to New England consumers by some Southern iron interests. Uniformly heavy shipments are now going out from furnaces week after week and in increasing volume. Furnacemen consider the outlook encouraging and are generally inclined to the opinion that the end of the slack period has been reached except as regards railroad business. We quote as follows for current quarter and first half of 1911:

No. 1 X foundry.....	\$14.75 to \$15.25
No. 2 X foundry.....	14.25 to 14.75
No. 2 plain.....	14.00 to 14.25
No. 3 foundry.....	13.75 to 14.00
Gray forge.....	13.75 to 14.00
Malleable.....	14.25 to 14.75
Basic.....	14.25 to 14.75
Charcoal.....	18.00 to 18.50

Finished Iron and Steel.—Orders continue to come along in fair volume and the feeling prevalent is that the outlook is favorable for a large increase in business as soon as election is over and the cause for a waiting attitude preserved in some quarters on that account is removed. There is continued active demand for tin plate and for wire products. The local agency of the leading interest has added considerably to its force of salesmen in connection with the solicitation of business for shipment from its warehouses and it is understood that these salesmen are meeting with considerable success in obtaining orders for prompt shipment. The Jones & Laughlin Steel Company has been awarded contract for the sheet piling to be used in connection with the government work at Oswego. The Canadian export trade continues active and contracts are being placed by Canadian jobbers and consumers for requirements for bar products covering the first half of next year. Little new work has developed in structural lines during the week. A number of structural steel bridges for Erie Barge Canal contracts are being figured and for two local buildings requiring small tonnages. The H. C. Harrower Company was low bidder for the steel work on the revised plans for the Habestro Building, Buffalo, 275 tons.

Old Material.—The market is exhibiting some signs of improvement and a considerably better feeling is evident. The demand is picking up in a number of lines, particularly in car wheels. Consumers are a little more inclined to buy for future needs and dealers are booking more business than for some time. Prices have not been affected by the awak-

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ening demand, except car wheels, which have advanced slightly. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$12.00 to \$12.50
Low phosphorus steel.....	17.00 to 17.50
No. 1 railroad wrought.....	14.00 to 14.50
No. 1 railroad and machinery cast scrap..	13.25 to 13.50
Old steel axles.....	17.50 to 18.00
Old iron axles.....	23.00 to 23.50
Old car wheels.....	14.00 to 14.50
Railroad malleable.....	13.00 to 13.25
Boiler plate.....	10.00 to 10.50
Locomotive grate bars.....	10.50 to 11.00
Pipe.....	10.50 to 11.00
Wrought iron and soft steel turnings..	6.75 to 7.00
Clean cast borings.....	6.25 to 6.50
No. 1 bushing scrap.....	11.25 to 12.00

San Francisco

SAN FRANCISCO, October 26, 1910.

Underlying conditions on the Pacific Coast are probably as healthy as in any other section of the country, if not more so, yet the slight improvement which has occurred in the iron and steel industry in other quarters is not reflected here. Aside from one or two lines the market continues to drag, and with the stock-taking period approaching there is little hope of an accelerated movement before the middle of the first quarter of 1911. The customary fall revival of the distributive trade has failed to develop, and the heavy stocks held in local warehouses are diminishing but slowly, giving jobbers no reason to enter the market. Merchants and mill representatives alike complain of poor collections. There is some movement in structural material, but the building situation on the whole is poor, and the persistent dullness in some lines is attributed to this fact. Manufacturers, moreover, are unwilling to take on large supplies in view of the unsettled labor conditions. Local importations of foreign steel are moderate at present, but arrivals at other points on the Pacific are large. Steel from Antwerp was the largest item in the importations at Los Angeles during September.

Bars.—Concrete construction work appears to be fairly active, as this material is being used for a number of local buildings, for harbor work and for many bridges, &c., in the interior. The movement of bars for reinforcing purposes, however, is considerably below expectations, and the majority of purchases are very small. Foreign bars, twisted in local shops, are coming into general use for this purpose. The larger manufacturing interests are confining their purchases of soft steel bars to the smallest possible limits and appear willing to continue this practice for some time. The small jobbing trade is nearly normal in most quarters, but is quiet locally, and the aggregate movement is highly unsatisfactory. Bars from store, San Francisco, are quoted at 2.25c. for iron and 2.45c. for steel.

Structural Material.—A good many extremely small jobs are coming out, but few of the medium class on which local fabricators have relied for most of their business. The contract for the Native Sons' Hall, which was withheld for several months, has been awarded to the Pacific Rolling Mill Company, and Dyer Bros., San Francisco, have the Eagles' Hall contract. The Central Iron Works has a small job on the San Francisco Turn Verein building. A contract for about 125 tons for the Central Methodist Church has been let to the Western Iron Works. Two fair jobs have been let at Portland, Ore.—1800 tons for the Lipman, Wolfe & Co. building and about 1000 tons for the Wilcox building—both being taken by the Northwest Steel Company. The largest job in sight is the Oakland city hall, on which figures will be taken shortly. The Davis Estate building, San Francisco, 800 tons, will probably be let next week, and figures are being taken on 850 tons for the Cortez Hotel at Sutter and Kearny streets. A local contractor has taken about 100 tons for the Honolulu Y. M. C. A. Plans have been completed for the Sacramento County courthouse and the contract will probably be let in December. Figures are being taken on the Hogue building at Seattle, Wash., 2000 tons, to be let October 31, and prospective requirements at that place include the Bon Marche department store, 2000 tons, and the L. C. Smith building. It is reported that bids will be taken shortly on a large federal building at Bellingham, Wash. Plans are being drawn for a large office building at Montgomery and Pine streets, San Francisco. Contracts are expected shortly for a drawbridge near Sacramento, Cal., and it is announced that the Southern Pacific will build a steel bridge over the San Joaquin River near Antioch, Cal. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—The tonnage booked since the middle of October has been light, but several substantial orders are expected to come out during November, the principal inquiry being street railway interests.

Plates.—Marine plates, as a rule, are an item of very

little importance in the Pacific Coast trade, but some demand is likely to arise from a number of repair jobs on hand. A contract will also be let shortly for a steel steamer for the Puget Sound Navigation Company, which is expected to go to a San Francisco firm, and the Port of Portland Commission, Portland, Ore., will build a large steel towboat. Tank plates remain rather quiet. Manufacturers have plenty of work on hand and in prospect, but have sufficient stock for present requirements, and are not yet inclined to make much provision for the future. The Standard Oil Company is preparing to install 15 new stills at Richmond, Cal.

Merchant Pipe.—The local distributive trade has shown scarcely any improvement for the last two months, and the outside demand is considerably below expectations. In the movement from manufacturer to jobber conditions are the reverse of those which existed a year ago, when large speculative orders were being placed for future delivery. Buying by merchants is at present limited to an occasional carload, with no prospect of any general movement until after the turn of the year. The oil industry is getting into better condition, but a number of shallow wells are coming in and little new development is being started. Up to July the pipe tonnage was somewhat in excess of the same period of 1909, but since then it has been steadily decreasing, and so far October has been about the dullest month of the year.

Cast Iron Pipe.—While no very large orders have been booked conditions are more favorable than for some time, and the aggregate tonnage, composed of small scattered orders, compares favorably with former records. The city of Santa Cruz, Cal., has placed its order with the United States Pipe Company. The city of San Diego, Cal., has voted \$340,000 bonds for extensions to the water system and will probably begin work about the first of the year. The town of Madera, Cal., is preparing plans for a complete municipal water system.

Pig Iron.—Demand is almost entirely lacking, and the market is somewhat demoralized. Several cargoes of English and Scotch iron have recently been landed at Seattle, Wash., but arrivals here are not heavy and are partially taken up by former contracts. There is considerable accumulation in the hands of importers, however, and melters are taking no interest in the market. It is hardly possible to sell anything to arrive and spot offerings can be moved only at a sacrifice. A considerable tonnage of English and Continental iron is held at about \$23, but this price can be obtained only in exceptional cases, and recent sales have been made at \$22 or less. A somewhat higher price can be had for favored brands of Scotch iron, but the movement of such material is extremely small.

Old Material.—Cast iron scrap continues to move in a small way, the majority of melters taking little interest. There is some activity in steel melting scrap, owing partly to the opening of a new plant, and sales amounting to 4000 tons have been made by one firm. Bates & Chesebrough, who shipped a large tonnage to the Atlantic Coast earlier in the year, are not in the market at present. The prices obtained from local interests are considerably higher than those quoted on the material shipped East. There is no movement of railroad wrought scrap locally, but good rolling mill scrap is quoted at \$13 to \$13.50 per net ton. Re-rolling rails are quiet, but prices are steadily maintained. Quotations based on recent transactions are as follows: Cast iron scrap, per net ton, \$18; steel melting scrap, per gross ton, \$12.50; re-rolling rails, \$15 per net ton. The last of the structural scrap left from the fire of 1906, held by the Bank of California, has been sold to the San Francisco Iron & Metal Company.

St. Louis

ST. LOUIS, October 31, 1910.

The seasonable weather now prevailing is giving some stimulus to general business. Houses catering to railroads find some improvement in the inquiry and count on an increase in the near future. Pig iron and coke are dull, the movement being mainly of a jobbing character, but there is rather more inquiry for pig iron, principally for first quarter of 1911.

Coke.—The demand for coke is of a jobbing character, covering small lots, mainly for prompt shipment. A leading merchant seller reports the sale of 25 cars of Collinsville foundry to various parties. We continue to quote for Collinsville 72-hour foundry, \$2.15 for prompt and \$2.35 for contract shipment, per net ton, at even. Complaint is growing concerning car shortage in both the Pennsylvania and Virginia fields.

Pig Iron.—The past week proved to be an exceptionally dull one in pig iron in this market. The consensus of opinion seems to be that no marked improvement can reasonably be expected until after the November election. Buyers claim that large interests in the country generally will hold off

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and that that will prevent any advance in the market, consequently they are disposed to await the result. In one instance, however, a merchant house expresses the opinion that it is a favorable time to buy and that it is doing so in the expectation of an active demand at better prices after election. We hear of the purchase by a local foundry of 2250 tons Southern No. 2 foundry for shipment over the first half of 1911; also by another consumer of 900 tons, part Southern No. 2 and part No. 4 foundry, for the same shipment. We quote Southern No. 2 foundry for shipment over the remainder of the year, \$11; for shipment over the first quarter, \$11.25; over the first half, \$11.50 f. o. b. Birmingham.

Finished Iron and Steel.—The leading interest reports the demand for standard rails slow, with some inquiry from mining interests for light rails. For structural material there has been an active demand, but mainly for highway bridge work. Steel bars are dull as regards jobbers, but there is some inquiry from agricultural implement manufacturers and wagon makers. For track material the demand is moderate.

Old Material.—Little business is passing, being mostly between dealers and at low figures. No improvement is looked for until the middle of November. The only railroad list on the market for the past week was 400 tons offered by the Chicago & Eastern Illinois, which was closed out at inside prices. A feature of the past few weeks is the small offerings of the railroads. The list is nominally unchanged with respect to prices, but there are hardly sufficient transactions to make a market. We quote dealers' prices as follows, per gross ton, f. o. b. St. Louis:

Old iron rails.....	\$14.00 to \$14.50
Old steel rails, rerolling.....	13.00 to 13.50
Old steel rails, less than 3 ft.....	12.25 to 12.75
Relaying rails, standard sections, subject to inspection.....	23.50 to 24.00
Old car wheels.....	13.50 to 14.00
Heavy melting steel scrap.....	12.00 to 12.50
Frogs, switches and guards, cut apart..	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates.....	\$11.00 to \$11.50
Iron car axles.....	18.50 to 19.00
Steel car axles.....	17.50 to 18.00
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	11.00 to 11.50
Railway springs.....	10.00 to 10.50
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	9.00 to 9.50
Mixed borings.....	4.50 to 5.00
No. 1 bushing.....	11.50 to 12.00
No. 1 boilers, cut to sheets and rings..	9.00 to 9.50
No. 1 cast scrap.....	11.50 to 12.00
Stove plate and light cast scrap.....	9.00 to 9.50
Railroad malleable.....	9.00 to 9.50
Agricultural malleable.....	8.50 to 9.00
Pipes and flues.....	9.00 to 9.50
Railroad sheet and tank scrap.....	8.50 to 9.00
Railroad grate bars.....	8.00 to 8.50
Machine shop turnings.....	7.50 to 8.00

The German Iron Market

BERLIN, October 20, 1910.

The chief interest of the market this week has been in the meeting of the Steel Works Union, which was held to-day at Düsseldorf for the purpose of taking action regarding prices of semimanufactured steel for the first quarter of 1911. Many of the members wanted to adopt higher prices, but it was voted to-day to leave them unchanged. It appears that the reason for not raising prices was the belief that the open hearth steel producers, who are not members, would be the chief gainers from such action. At present these independent producers are bidding sharply and successfully against the union for steel orders in the home market. By keeping just under the union's prices they are able to hold a steady run of buyers, and their business would only be increased under higher union prices. This applies to the home market only, however, as the union allows consumers a drawback on exported finished products, which serves as a special stimulus to the export trade in products made from its material. Another fact in this connection is the prospect that the open hearth makers are soon to be reinforced by the Niederrheinische Hütte, the furnace company of Prince Donnersmarck variously mentioned already in this correspondence. This concern is erecting a large rolling mill for producing the heavier forms of semirolled steel, and it will begin production within a few weeks.

Another matter which came up at to-day's meeting of the union was an application of the Bar Iron Convention to raise the allotments in bars 10 per cent. This convention met yesterday with the intention of advancing prices, but adjourned over pending action by the union. The latter, however, rejected the application, and the convention later declared business in bars for the first quarter of 1911 open at unchanged prices. It had been proposed to lift prices by 2 marks per ton. The firm tenor of prices, however, is indicated by the fact that the Heavy Plate Convention two

days ago voted to raise ordinary plates 2 marks. A proposal to raise boiler plates also was postponed. Corrugated tubing was also advanced 2 marks.

The union to-day gave out its usual monthly survey of the market, covering half-rolled material, rails and structural shapes. Home consumers of steel material, says the report, have almost fully covered their requirements for the current quarter, the amounts taken being mostly greater than for previous quarters, and the foreign market is buying in better volume. The foreign demand for steel rails also keeps up. Grooved rails are quieter, and this is also true of the home market for mine rails, but the foreign market for the latter remains quite active. The home demand for structural shapes has improved, and still better business is looked for now that the shipbuilders have returned to work.

The latest news from the ore market indicates that the situation remains firm. Further advances for both home and foreign ores have been made. In the Siegerland district, where a restriction of production by 15 per cent. is nominally maintained, the mines are now producing to their full capacity for the first time in several years. The stock of ores at the mines is being steadily depleted. Idle furnaces in that region are being blown in. Foreign ores are arriving in very large amounts this month—524,000 tons during the first ten days of the month, as compared with only 86,000 tons last year.

Now that the new Pig Iron Syndicate of Essen has begun to take orders for 1911 a somewhat more active trade in crude iron has set in, but the change is by no means marked, since most consumers had already contracted for their requirements for the first half of that year.

Export business in bars has increased in volume this month, the export drawback of 6 marks per ton having gone into effect on the 1st. The mills are nearly all fully stocked with orders to the end of the year. The plate market is in satisfactory shape, although a quieter tone prevails. Medium thicknesses are in good demand. Ship plates are quieter. Machinery shops are receiving pretty fair orders, but prices remain unsatisfactory. The position of the hardware trade continues to improve slowly.

Imports of iron and steel last month amounted to 51,281 tons, against 36,920 tons last year; exports were 404,472 tons, against 342,626 tons. For nine months imports were 409,954 tons, against 333,949 tons, and exports, 3,575,844 tons, against 2,879,487 tons. The surplus of exports over imports was 3,165,890 tons, against 2,545,538 tons.

New York

NEW YORK, November 2, 1910.

Pig Iron.—The buying of foundry iron in this market in October was probably larger than in any other month of the year. It may also be said that there was a progressive decline in prices throughout the month. Furnaces that have held aloof from the market for some time in the expectation of a turn for the better have been at last willing to sell rather freely for first quarter's delivery, and competition has been sharp in a number of instances. In other cases there has been quiet buying without much competition, but the prices named have been so low as to make buying easy. Some large Eastern interests have been in the market, including foundries in New York and New Jersey and in Greater New York. New England machinery foundries have not been as active in the past week as in several weeks preceding. Nearly all classes of foundries have been represented in the late buying. Apart from the purchases of the two large radiator interests, one of which has probably closed at various points for as much as 30,000 tons in October and the other for somewhat less (in buying beginning in September and scattered over the past six weeks), most of the recent business for delivery in 1911 has been in 500 to 1000 ton lots. Stocks, particularly of basic iron, have been increasing in the East and a blowing out movement has begun. One furnace in the Lehigh Valley blew out last week and another will probably follow. A Schuylkill Valley furnace will blow out this week. One Virginia furnace has gone out and another will probably blow out this month. Our quotations are but little changed, but the minimum is more generally the basis of transactions than in the past two weeks. For tidewater deliveries we quote Northern No. 2 foundry, \$15.75 to \$16; No. 2 X, \$15.25 to \$15.50; No. 2 plain, \$15.25; Southern No. 1 foundry, \$15.50 to \$16; No. 2, \$15.25 to \$15.50.

Finished Iron and Steel.—October was as good as or better than September in all lines. The American Bridge Company took 21,000 tons, as against 19,000 tons in September which, while not a very great increase in tonnage, is a fair per cent. and about represents the ratio of improvement in general. One bar iron mill reports that orders have been received in better volume the past week than for

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the two months previous. Good specifications are being received on steel bar contracts. The plate trade is not very active. Local consuming shops have little to do. Considerable interest is being taken in the new battleship to be built by the Government. It will require 10,000 to 12,000 tons of plates, shapes and bars, and bids go in December 1. Some of the railroads are showing more disposition to contract for their requirements in certain lines. Business is still dull in structural lines, but several quite fair orders have been closed recently. The Hay Foundry & Iron Works has taken 2000 tons for the Jacob Sinn warehouse in New York City; Levering & Garrigues, 550 tons for a stockhouse for the H. G. Hupfel Brewery in Brooklyn and 350 tons for a storage warehouse at Bremen and Noll streets, in Brooklyn; the McClintic-Marshall Construction Company, 400 tons for the Press Building in Pittsburgh and 1750 tons for the Cortlandt street ferry work for the Pennsylvania Railroad in New York; the American Bridge Company, 2000 tons for the Philadelphia & Reading grade crossing elimination work at Port Richmond, 200 tons of truss rods for the Chicago, Milwaukee & St. Paul, and will also get the Florida East Coast Railroad work, 7000 tons; the Virginia Bridge & Iron Company, 450 tons for a viaduct at Petersburg, Va.; the Phoenix Bridge Company, 900 tons for a power station for the Capitol Traction Company, Washington, D. C. The time for receiving bids for the post-office at the Pennsylvania Station in New York has been extended one month. It is thought now that the tonnage to be required, which had been estimated at 14,000 to 18,000, will not be over half that amount. Bids have not yet been asked on the 5000 tons for the Woolworth Building, New York. Bids have been offered on several small bridges for the New York, New Haven & Hartford, aggregating about 350 tons. Awards have not yet been announced on the general contracts for the New York subway work. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Cast Iron Pipe.—Several public lettings are being made this week. The Department of Water Works, Providence, R. I., will open bids on about 800 tons to-day; the Department of Public Works, Pawtucket, R. I., on about 1300 tons on Thursday; the Department of Public Works, Yonkers, N. Y., on about 500 tons next Monday. Manufacturers of this vicinity are making bids on a much larger quantity of pipe to private water and gas companies than usual at this time of the year, for delivery next spring. Some of the most clever buyers are now endeavoring to cover their next season's requirements. The market for immediate delivery of small sizes is somewhat disturbed by the persistent efforts of one or two founders to dispose of the stocks accumulated during the late summer and early fall months. Carload lots of 6-in. continue to be quoted at \$22.50 to \$23.50 per net ton, tidewater.

Ferroalloys.—There have been some good sales of ferromanganese in this market and some large transactions have been made at \$39, seaboard, for delivery over the first half. It is estimated that fully 10,000 tons of ferromanganese have been sold throughout the country in the last three weeks. The demand for ferrosilicon is good, but buyers seem to be taking it only as they need it and in small quantities. Sellers here are quoting \$56.50, Pittsburgh.

Old Material.—The somewhat hopeful feeling which prevailed among local dealers for the past week or two has faded since buyers have failed to make anticipated purchases. The steel companies of the East are apparently over-supplied with stocks of heavy melting steel scrap, the rolling mills are almost completely out of the market and the foundries are doing very little buying. Another lot of miscellaneous scrap from Panama, 1013 tons, was sold last week at \$9.36 per gross ton, f.o.b. Hoboken. It went to a buyer in central Pennsylvania. The next highest bid was \$9.35 from a buyer near Philadelphia. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails.....	\$12.50 to \$13.00
Old girder and T rails for melting.....	11.50 to 11.75
Heavy melting steel scrap.....	11.50 to 11.75
Relaying rails.....	20.50 to 21.50
Standard hammered iron car axles.....	22.50 to 23.00
Old steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	14.00 to 14.50
Wrought iron track scrap.....	13.00 to 13.50
No. 1 yard wrought, long.....	13.00 to 13.50
No. 1 yard wrought, short.....	12.00 to 12.50
Light iron.....	5.50 to 6.00
Cast borings.....	7.00 to 7.50
Wrought turnings.....	7.00 to 7.50
Wrought pipe.....	10.50 to 11.00
Old car wheels.....	12.00 to 12.50
No. 1 heavy cast, broken up.....	12.50 to 13.00
Stove plate.....	10.00 to 10.50
Locomotive grate bars.....	9.50 to 10.00
Malleable cast.....	12.50 to 13.00

One furnace of the Dunbar Furnace Company, Dunbar, Pa., blew in October 24.

Metal Market

NEW YORK, November 2, 1910.

THE WEEK'S PRICES

Copper				Lead		Spelter	
	Lake.	Electro-lytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
Oct. 27.....	12.87½	12.80	36.40	4.40	4.27½	5.60	5.45
28.....	12.87½	12.75	36.30	4.40	4.27½	5.75	5.60
29.....	12.87½	12.75	...	4.40	4.27½	...	...
31.....	12.87½	12.75	36.50	4.40	4.27½	...	...
Nov. 1.....	12.87½	12.75	36.55	4.40	4.27½	5.95	5.80
2.....	12.87½	12.75	36.80	4.40	4.27½	5.95	5.80

The stocks of pig tin for spot delivery are more plentiful and the holdings are better scattered. Pig tin in New York is now below the cost of import, which indicates that the London corner continues strong. Copper is holding very firmly, but the buying movement has ceased. Spelter has advanced sharply and is costing close to 6c. a lb., New York. Lead is dull but firm.

Copper.—The copper market has settled down in anticipation of the forthcoming report of the Copper Producers' Association, covering October statistics. A very good report is expected as a result of the late heavy buying, and in consequence sellers show no disposition to shade prices in order to obtain business; some of them predict higher prices within the next fortnight. The report of the New York Metal Exchange shows that exports in October were especially large and the total for the first ten months of the year show a decrease of only 10,062 tons as compared with the same period of last year. Copper is now selling at about 12.75c. for electrolytic and 12.87½c. for lake. These figures make electrolytic five points lower than our quotation of last week, but the recession is due to the fact that one large interest has persistently sold at that price, while others were selling at 12.80c., and as there has not been much buying the general trade has reduced quotations five points, more with a view to pleasing customers than because of any indication of weakness in that market. L. Vogelstein & Co., report the following figures of German consumption of foreign copper for the months January-September, 1910: Imports, 129,440 tons; exports, 6,938 tons; consumption, 122,502 tons, as compared with consumption during the same period in 1909 of 114,900 tons. Of the above quantity 111,131 tons were imported from the United States. In London to-day spot copper sold for £57 15s., and futures £58 15s. The sales amounted to 1200 tons of spot and 2300 tons of futures. The market was firm.

Pig Tin.—Consumers have been taking fair quantities of pig tin and that has accounted for a slight advance in the market during the week. The arrival of the steamer Minneapolis with a large cargo relieved the tension here and tended to break up the corner in spot stocks to some extent. The steamer Minneapolis is now in with 780 tons and when the stocks are scattered among the trade it is thought that consumers will get a better chance to buy at a normal price. As a matter of fact, tin is now selling in New York at less than the cost of import, which goes to show that this market is not responding so quickly to London fluctuations. Judicious buying on the part of consumers here covering their future wants should relieve them from paying any excessive price for spot tin during the next two weeks. There was nothing unexpected in the Metal Exchange report of the pig tin statistics for October, which came out this morning. Deliveries into consumption were good, amounting to 3350 tons, and the total for the first 10 months of the year shows an increase of 3650 tons, as compared with the same period of last year. The total visible supply October 1 was 541 tons below that of October 1, 1909. The figures show no great change in the statistical situation during the month. Pig tin was sold in New York to-day for 36.80c. In London to-day spot tin was sold for £168 7s. 6d. and futures for £168 12s. 6d. The sales amounted to 220 tons of spot and 620 tons of futures. It can be seen from the above that future tin is very close to the price of spot and it is very likely that futures are being taken up by the people operating the London corner.

Tin Plates.—There is little to say about the tin plate market. An average demand exists and the price for 100-lb. coke plates continues at \$3.84.

Lead.—Lead is firm but dull, and that is to be expected, as this is usually considered the quiet season in the lead market. Prices are being held firmly and the leading interest is selling at 4.40c., New York, while outside sellers are asking anywhere up to 4.45c. The St. Louis market, which was weak some time ago, has strengthened noticeably and is being held very firmly at 4.27½c.

Spelter.—Spelter is hovering close to 6c. and the frequently expressed opinion on the part of large producers that consumers would have to pay that figure seems to have ap-

parently come true. Spelter could be had in New York this morning at 5.95c., but to-morrow the figure may be 6c. There is very little buying, and this advance has simply been brought about by a steady increase in quotations by sellers. As a matter of fact there has been so little buying that it is hard to tell from day to day just what the price is. It is apparent that those who have spelter in hand are keeping in close touch with each other and it is also very apparent that they are in control of the situation.

Antimony.—Antimony is quiet and weak. Cookson's is costing 8.15c.; Hallett's, 7.75c.; Chinese brands are from 7.40c. to 7.50c. Hungarian grades can be had at all sorts of prices from 7.12½c. up.

Old Metals.—The market is quiet, but dealers' selling prices are unchanged, as follows:

	Cents
Copper, heavy cut and crucible.....	12.50 to 12.75
Copper, heavy and wire.....	11.75 to 12.00
Copper, light and bottoms.....	11.00 to 11.25
Brass, heavy.....	8.25 to 8.50
Brass, light.....	7.00 to 7.25
Heavy machine composition.....	11.25 to 11.50
Clean brass turnings.....	8.00 to 8.25
Composition turnings.....	9.00 to 9.50
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc scrap.....	4.30 to 4.40

Metals, St. Louis, October 31.—Lead is dull and slow at 4.30c.; spelter is active and strong at 5.60c. to 5.70c., both East St. Louis. Zinc ore is firm and higher at \$44 to \$45 per ton, Joplin base. Tin is quoted at 36.50c. per lb.; antimony (Cookson's), 8.50c.; lake copper, 13.35c.; electrolytic, 13.25c., all at St. Louis. The demand for finished metals shows some improvement over the previous week, but is still below the corresponding week last month.

Metals, Chicago, November 1.—A fair amount of business is being done in copper, with no change in prices. Some orders have been placed for January shipment, but the business done is principally for November and December. Tin continues very erratic and printed quotations have been an unreliable index of the market for a long time, owing to the frequent changes in price. Spelter is advancing in a very persistent manner and evidently reflects improvement in the demand for galvanized sheets and wire products. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13¼c., in carloads, for prompt shipment; small lots, ¾c. to ¾c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2¼c. per 100 lb., higher; spelter 5.80c. to 5.85c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is \$7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Iron and Industrial Stocks

NEW YORK, November 2, 1910.

The stock market has been considerably quieter in the past week, probably due to a feeling of caution as election day approaches. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	9½ - 10	Pressed St., pref..	96 - 96½
Allis-Chalm., pref..	32½ - 34	Railway Spr., com.	35½ - 36
Beth. Steel, com..	30½ - 33½	Republic, com....	33½ - 35½
Beth. Steel, pref..	58½ - 61½	Republic, pref....	96½ - 98½
Can. com.....	9½ - 10½	Sloss, com.....	50½ - 53½
Can. pref.....	73 - 76½	Pipe, com.....	17
Car & Fdry, com..	53½ - 54½	Pipe, pref.....	56 - 60
Car & Fdry, pref..	113½ - 114	U. S. Steel, com...	76½ - 80½
Steel Foundries....	46 - 49½	U. S. Steel, pref..	119 - 120
Colorado Fuel....	33½ - 35	Westinghouse Elec.	72 - 74
General Electric...	154 - 157½	Am. Ship, com....	79½ - 80
Gr. N. ore cert....	57½ - 59½	Am. Ship, pref....	110 - 111
Int. Harv., com...	108½ - 111½	Chl. Pneu. Tool...	40 - 41
Int. Harv., pref...	123 - 123½	Cambria Steel....	43½ - 44½
Int. Pump, pref...	82½ - 83	Lake Sup. Corp....	25 - 27
Locomotive, com...	39½ - 41	Warwick.....	10½ - 11
Locomotive, pref...	106½ - 108½	Crucible St., com.	12½ - 13
Pressed St., com..	34 - 34½	Crucible St., pref..	78 - 79½

Dividends.—The J. G. Brill Company has declared the quarterly dividend of 1¼ per cent. on the preferred stock, payable November 1.

The International Harvester Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred, payable December 1.

The Imperial Automobile Company, Jackson, Mich., has declared a 30 per cent. dividend and stock increase from \$150,000 to \$450,000.

The Pennsylvania Steel Company has declared the regular semiannual dividend of 3½ per cent. on the preferred stock, payable November 1.

The Pressed Steel Car Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable November 23.

Allis-Chalmers Company's Report

A Heavy Increase in Profits

The annual report of the Allis-Chalmers Company, covering the operations of the fiscal year ending June 30, 1910, makes the following comparative exhibit of earnings:

	1910.	1909.
Profit on operation.....	\$2,576,818	\$1,809,009
Maintenance, depreciation, interest, &c.	2,081,086	1,673,578
Net profit for year.....	495,732	135,431
Previous profit and loss surplus.....	521,420	383,997
Surplus.....	\$1,017,161	\$521,420

The general balance sheet, as of June 30, compares as follows:

Assets.	1910.	1909.
Discounts and commissions.....	\$2,683,189	\$2,683,189
Real estate, &c.....	38,335,395	37,548,053
Bills and accounts receivable.....	4,841,089	4,721,052
Merchandise, material, &c.....	8,503,634	5,580,447
Cash.....	1,178,181	2,289,017
Development patent account.....	1,318,091	1,318,092
Investment.....	301,006	260,000
Totals.....	\$57,220,538	\$54,409,850
Liabilities.		
Preferred stock.....	\$16,050,000	\$16,150,000
Common stock.....	19,820,000	19,820,000
Accounts payable.....	2,125,153	1,205,501
Mortgage bonds.....	11,148,000	11,148,000
Notes payable.....	3,655,000	2,400,000
Accrued bond interest.....	278,700	278,375
Depreciation reserve.....	1,955,822	1,714,845
Bullock Electric Company stock....	1,170,700	1,170,700
Surplus.....	1,017,161	521,420
Totals.....	\$57,220,538	\$54,409,850

From President W. H. Whiteside's accompanying remarks, the following extracts are taken:

"In an industry like that of the Allis-Chalmers Company, which is largely the manufacture of heavy machinery requiring time to build, the results of each year must depend to a great degree upon the previous year's demand. The business booked began to improve during the latter half of the fiscal year ending June 30, 1909, and this improvement has continued during the past year, the sales invoiced and orders booked being, respectively, 29½ and 40 per cent. in excess of the previous period. Of the sales invoiced this year about 55 per cent. was for new lines of business which the company has recently developed, and of these new lines about 75 per cent. was electrical.

"While there has been an improvement in the company's earnings during the fiscal year the various works have been operated at less than 60 per cent. of their present capacity, due to the unsettled condition of the country. There has been a very small demand for heavy machinery, which restricted the company's operations largely to the higher lines, and this necessitated considerable development of new types of small machinery, for which there has been a fair demand.

"Inquiries and negotiations in hand justify the hope that business will soon regain steadiness to the end that uniform bookings may obtain to the full capacity of our present plants.

"There has been no change in the status of the company's first mortgage bonds. That item remains \$11,148,000. The treasury bonds have been increased by the addition of \$563,000 par value. These bonds are authenticated by the trustee in accordance with the mortgage indenture and available for sale to reimburse the treasury for cash outlays made during the year for property and plant."

The Griffin Mfg. Company, Erie, Pa., manufacturer of builders' hardware, operates a cold rolling and pressed steel plant. Improvements being completed at the works embrace two extensions of 40 x 90 ft., and one, 45 x 120 ft., two stories. The company is installing considerable additional equipment.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Commercial Reports Not Actionable as Libel.—One is not liable for libel in giving his honest opinion as to the integrity and standing of a tradesman in response to an inquiry concerning him.—Colorado Supreme Court, *Melcher vs. Beeler*, 110 Pacific Reporter 181.

Rights of Seller Respecting Payment of Price.—Sale is presumed to be made for cash in the absence of a provision for credit. In such cases the seller is entitled to reclaim the property if payment is not made on delivery; and, unless he has waived cash payment, he can reclaim the property in the hands of an innocent third person. A delivery of goods voluntarily and without payment being insisted on waives cash payment.—Oregon Supreme Court, *Johnson vs. Iankovetz*, 110 Pacific Reporter 398.

Remedy of Buyer for Breach of Warranty.—On breach of warranty of the soundness or fitness of an article sold, which the buyer has had no opportunity to inspect before delivery, he may make his election either to rescind the contract or to affirm it by accepting and keeping the property, and, when sued for the price, set up the false warranty by way of an offset.—Arkansas Supreme Court, *B. A. Stevens Company vs. Whalen*, 129 Southwestern Reporter 1081.

Necessity for Reducing Sale Contract to Writing.—Where all or a large part of articles agreed to be sold are not in existence and are to be manufactured, the contract need not be reduced to writing.—South Carolina Supreme Court, *Wallace vs. Dowling*, 68 Southeastern Reporter 571.

Seller's Remedy for Buyer's Breach of Contract.—Where a buyer of goods breaks the contract to purchase, before delivery and before title passes to him, suit for damages for the breach and not for the price is the seller's proper remedy.—Alabama Supreme Court, *St. Louis Hay & Grain Company vs. American Cast Iron Pipe Company*, 52 Southern Reporter 904.

Effect of Contracts of Sale.—As a general rule title to articles sold vests in the buyer on delivery of them to a railroad company for transportation to him. A contract for a sale f.o.b. cars at Detroit to one living in another State is governed by the laws of Michigan and not of the State where the buyer lives. Unless credit is expressly stipulated, a sale is presumed to have been made for cash. Where a derrick car was ordered, "Price \$1160, f.o.b. cars, Detroit," no credit was agreed upon and the invoice was marked "Terms cash" and "Title to the property in this invoice reserved to seller until full payment made," payment of the price was a condition precedent to the passing of title to the buyer unless waived.—United States District Court, Western District of Pennsylvania, *In re Pittsburgh Industrial Iron Works*, 179 Federal Reporter 151.

Right to Recover Value of Old Engine Traded on New One.—Where, as part payment for an engine, the buyer agrees to return an old engine, demand for the latter must be made before the obligation to return it can be converted into an obligation to pay its value.—New York Supreme Court, Appellate Division, Second Department, *Otto Gas Engine Works vs. Moore*, 123 New York Supplement 934.

Duty of Seller of Articles in Shipping Them.—Delivery of articles by the seller to a railroad company for transportation to the buyer is not binding on the buyer, as a delivery to him, unless the seller places the articles in such condition for shipment that the buyer can recover from the railroad company for any damage in transit.—Alabama Supreme Court, *Butterworth & Lowe vs. Cathcart*, 52 Southern Reporter 896.

Rights Under Contracts of Sale.—On a breach of warranty of a thing sold the buyer may keep the article and sue the seller for the difference between its value as warranted and its actual value, or, by acting within a reasonable time, he can return the article and recover payments made. A seller impliedly warrants that the subject of sale is fit for the purpose for which it is intended. By accepting benefits of a contract made by his agent, the seller precludes himself from repudiating representations made by the agent to effect the sale. Positive representations by a seller respecting the quality and condition of the article, intended to be, and relied on by the buyer, amount to warranties.—Springfield, Mo., Court of Appeals, *Lanmeier vs. Dolph*, 130 Southwestern Reporter 360.

Rights Under Contracts of Sale.—Where a contract of sale is silent as to time of delivery, it must be tendered within a reasonable time. The buyer has an unqualified right to cancel the contract before it is executed, thus escaping liability for the agreed price, but by doing so he incurs liability for breach of the contract, which is measured by the difference between the market price of the articles and the contract price.—Massachusetts Supreme Judicial Court, *Barrie vs. Quimby*, 92 Northeastern Reporter 451.

When Title Passes Under Cash Sale.—Where a seller de-

livers articles, relying on an agreement for payment of the price on delivery, title does not pass from him until payment.—Ohio Supreme Court, *Baltimore & Ohio Southwestern Railway Company vs. Good*, 92 Northwestern Reporter 435.

Fire Insurance Defeated by Failing to Keep Inventory.—There can be no recovery on a fire insurance policy where insured has failed to keep an inventory of the insured property, as required by the policy, unless he shows that loss of the inventory was without fault on his part, though there be abundant proof that the loss exceeds the amount of insurance.—Texas Court of Civil Appeals, *National Fire Insurance Company vs. J. W. Caraway & Co.*, 130 Southwestern Reporter 458.

Acceptance of Articles Sold.—Where one who agreed to buy several pieces of old machinery went to inspect them, the fact that he broke one of them up preparatory to removing it as junk, showed an acceptance of part of the machinery, within the statute which permits certain contracts of sale to be oral, if the buyer receives part of the goods. The buyer's act also constituted a waiver of his right to examine the other pieces of machinery, though he intended to reject them if they were not satisfactory.—Vermont Supreme Court, *Patterson & Holden vs. Sargeant, Ongood & Roundy Company*, 77 Atlantic Reporter 338.

Right of Corporation to Dispute Validity of Mortgage.—A corporation which has received and used the entire consideration paid to it on the faith of a mortgage cannot attack the execution of a mortgage for want of proof of a formal authorizing resolution of the directors.—New Jersey Chancery Court, *Earl vs. National Metallurgic Company*, 76 Atlantic Reporter 555.

Ground for Dissolution of Partnership.—That a special partner has become a special partner in a competing business entitles his associates to a dissolution of the partnership.—New York Supreme Court, *Skolney vs. Richter*, 123 New York Supplement 788.

Powers of Corporations.—A corporation has implied power to borrow money and make negotiable paper for use within the scope of its own business, but it has no power to become an accommodation party to a bill or note.—Arkansas Supreme Court, *Simmons National Bank vs. Dilley Foundry Company*, 130 Southwestern Reporter 162.

Rights in Corporate Names and Trademarks and Trade Names.—A corporation has an exclusive right to the use of its own name, and it will be protected by injunction against the use of such name by another corporation. A corporation may, by user, acquire a right to a trade name other than its corporate name in connection with goods manufactured and sold by it, and as descriptive of them. Generally geographical names are not the subject of exclusive appropriation as trademarks or trade names. But such names, in connection with other words, may sometimes acquire a secondary signification, indicative not only of the place of manufacture, but of the character of the product, so that the name or title thus employed, including the geographical word, may be the subject of protection against unfair competition in trade.—Georgia Supreme Court, *Rome Machine & Foundry Company vs. Davis Foundry & Machine Works*, 68 Southeastern Reporter 800.

Damages Recoverable for Infringement of Patent.—In an action to recover profits derived from infringement of a mere feature of a machine, recovery must be restricted to the part of the profits of the entire machine which arose from such feature.—United States Circuit Court of Appeals, Eighth Circuit, *Brown vs. Lanyon Zinc Company*, 179 Federal Reporter 300.

New Publication

Annual of the French Iron Masters' Association.

Edition 1910-1911.—(Annuaire du Comité des Forges de France.) Pages, 1079, 5 $\frac{3}{8}$ x 8 $\frac{3}{8}$ in. Published by the association, 7 Rue de Madrid, Paris. Price, 10 francs.

This bulky volume is, first of all, a directory of the iron and steel works of France, giving the names of officers of the various companies, with details of plants and products. Information is also given concerning the various district organizations in the iron and steel trades, with details of their methods of operation. Another section is devoted to statistical matter dealing with the production and shipments of iron ore, pig iron and various forms of finished iron and steel for France and other countries. Other portions of the book deal with the various ministerial bureaus of trade and industry in France, together with legislation and decisions affecting industrial operations, accidents and relations of employer and employee.

Personal

J. C. Smith, formerly with the Otis Elevator Company, Chicago, has been made general manager of the Haggie-Woodruff Pressed Steel Company, Joliet, Ill.

Walter Meiggs Bush, for the past five years purchasing agent for Levering & Garrigues, New York, has been elected treasurer of the Baltimore Bridge Company, Baltimore, Md. He has also been appointed assistant manager of the company, with headquarters at the general offices and works, Bush street and Baltimore & Ohio Railroad.

H. B. Applewhaite, who has been connected with T. C. Bashor and the T. C. Bashor Company, Baltimore, Md., for over 30 years, and for a long time served as assistant manager, has resigned and retired from the engineering business.

E. M. Allen, vice-president and general manager of the American Refractories Company, Chicago, has returned from a six weeks' visit to the company's magnesite works in Austria.

J. K. Griffith, who for nearly 22 years has been superintendent of the steel plant at Latrobe, Pa., built by the Latrobe Steel Company and since 1905 owned by the Railway Steel Spring Company, has resigned, effective October 31, continuing a relationship in an advisory capacity. His other interests, notably the International Text Book Company, Pittston, Pa., have grown so extensive as to require his personal attention and he will remove to Pittston. He will also probably become active in promoting a cast steel car wheel for which he holds patents.

Peter Donaldson, of James Watson & Co., Glasgow, Scotland, president and managing director of the Dayton Coal & Iron Company, Ltd., Dayton, Tenn., is making his annual visit to the United States.

W. H. Wonfor, advertising and export manager of the Wm. Powell Company, Cincinnati, Ohio, returned last week from a three months' business trip, through Mexico.

John H. Sullivan has been appointed Western sales representative of the American Spiral Spring & Mfg. Company, Pittsburgh, with office in the Commercial National Bank Building, Chicago.

The Goldschmidt Thermit Company, 90 West street, New York, announces that Dr. F. H. Hirschland has been elected vice-president.

Cecil Grenfell, M.P., London, England, has been spending the past week in Alabama looking over the properties of the Southern Iron & Steel Company, in which European investors are interested.

Benjamin B. Friedenwald of Friedenwald Brothers, Baltimore, Md., will sail next week for an extended trip abroad in connection with the firm's foreign business.

Seward Babbitt, Buffalo, N. Y., for a number of years sales manager of the gas engine department of the Power & Mining Machinery & International Steam Pump Company, has resigned his position and returns to the William Tod Company, Youngstown, Ohio, with which company he was formerly associated.

Philip Corbin, president of the American Hardware Corporation, New Britain, Conn., who has been ill for some time, is now in a critical condition.

F. F. Fitzpatrick, hitherto vice-president, has been elected president of the Railway Steel Spring Company. Scott Hayes, chief of the sales department, has been elected vice-president.

A successor to O. A. Blackburn, vice-president of the Sharon Steel Hoop Company, Sharon, Pa., who recently resigned, will not be chosen until the annual meeting of the company, which is to be held in February. It is understood that S. P. Ker will continue as president.

Obituary

JAMES J. SMITH, president of the Smith Structural Steel Company, Kansas City, Mo., died October 27, aged 76 years. He settled in Kansas City 45 years ago and engaged in the iron business, becoming connected with the Keystone Iron Works in Kansas City and the Riverside Iron Works at Riverview, Kans., afterward becoming president of the structural steel company with which he was identified in recent years. He leaves a widow and one daughter.

WILLIAM McAVITY, for 45 years associated with the firm of T. McAvity & Sons, St. John, N. B., in charge of the manufacturing branch of the business, died October 28. His father, Thomas McAvity, was founder of the firm. He served his apprenticeship as a machinist in one of the largest machine shops in Boston, Mass.

JOHN HARLIN, founder of the McNab & Harlin Company of New York and Paterson, N. J., and for many years its president, died October 28. He was a pioneer in the steam valve business and the inventor of several appliances. He was born in Ireland, and came to this country with his parents 70 years ago.

LYNDE BELKNAP, treasurer of the Otis Elevator Company, died suddenly in the company's New York office October 28, presumably from acute indigestion. He was 50 years old, and had been in the company's service for 25 years.

JAMES B. MACLAREN, president of the Ottawa Steel Casting Company, Ottawa, Ont., died October 23, in New York.

The United Metal Trades Association of the Pacific Coast states in a recent bulletin that a strike of the iron shipbuilders in the plant of the Moran Company, Seattle, only continued three days when the workmen returned under the same conditions prevailing at the time of the strike. There was no grievance as to wages or hours, but the men went out because they were intimidated and threatened with assault by union leaders. The statement is further made that the largest machine shop in Portland that signed up with the Machinists' Union when the general machinists' strike was called has declared for a 9-hour day and abrogated its agreement with the union. This leaves only three quite small union machine shops in Portland. Evidently the machinists' strike is petering out.

At the organization meeting of the Board of Directors of the Crucible Steel Company of America, held in Pittsburgh on Wednesday, the following were elected for the ensuing year: Executive Committee—Herbert Dupuy, C. C. Ramsey, James H. Park, George E. Shaw, H. S. A. Stewart, John A. Sutton and H. D. W. English. Herbert Dupuy, chairman; Executive Committee; C. C. Ramsey, president; John A. Sutton, first vice-president; O. H. Wharton, third vice-president; G. W. Sargent, fourth vice-president; Chas. W. Rowlands, secretary; Geo. A. Turville, treasurer. The office of second vice-president, formerly held by John A. Sutton, will not be filled for the present.

The P. J. Brown Construction Company has removed from 1210 New England Building to more spacious quarters at 1340 Rockefeller Building, Cleveland. The company's special field is blast furnace, coke oven, rolling mill or open hearth brick work construction.

The Southern Shovel Mfg. Company, Gadsden, Ala., has shut down its plant and is making extensions and improvements with a view to making the entire output self-sharpening shovels and spades.

The Machinery Markets

The railroads are taking more interest in the machinery markets, especially in the East, where some good sized orders have been placed by the Delaware, Lackawanna & Western Railroad against a \$75,000 list which had been held up since last May. In other parts of the country the railroads are buying against small requisitions. In Chicago inquiries are increasing, and there, as well as in other sections, gas engine makers have been doing a very good business. In Milwaukee a good business has been done in heavy machinery, especially in the line of cranes, rock and ore machinery and Corliss engines. Machinery of every kind is in fairly good demand in Detroit, where new factory installations form the main factor in the buying. The same condition exists in Cleveland. Business is on a fairly satisfactory basis in Pittsburgh, where the trade is well distributed. Machine tool builders have taken on a little more work in Baltimore, but a decrease in activity is reported in that line in Philadelphia. In other sections of the country business is fairly regular, with nothing of marked importance to note, except on the Pacific Coast, where the buying for mining operations has been very heavy, which is partly due to replacements on account of forest fires. As the result of activity in this field a gradual and steady gain is felt in other lines.

New York

NEW YORK, November 2, 1910.

There are a number of new manufacturing enterprises in prospect in this vicinity that may in the future develop business for the machinery trade, but as yet they have not resulted in inquiries. Business has not been good during the last week, and new inquiries just now are decidedly scarce. The only activity of any kind is shown by the railroads. One large New York machinery house is reported to have booked two extensive orders from railroads in the last fortnight, one consisting of an entire list from a Western railroad. The Delaware, Lackawanna & Western Railroad has been placing orders of late against an extensive list of machine tools issued last May, which had been held up since that time. This list covered 30 or more machine tools, many of them in the larger sizes, and it is estimated that it calls for expenditures amounting to at least \$75,000. Fortunately for the trade in general, the purchases of the Delaware, Lackawanna & Western Railroad against this list have been fairly well scattered and a number of houses have obtained a good slice of the business in the last few days. The Pennsylvania Railroad shows signs of closing orders against a few tools it has inquired for, and it is said on good authority that the New York Central Lines will buy against some inquiries recently made. Beyond this railroad activity there is nothing of importance in the market. The demand for second-hand machinery is decidedly better than the call for new equipment.

The teamsters' strike in Manhattan and Jersey City was extended early this week to Brooklyn, and as a result manufacturers and dealers in machinery are having a great deal of trouble in getting and making deliveries. In some cases, shipments of machinery which are badly needed are being held up at the railroad terminals.

Plans are well under way for the new service building which is to be erected in Long Island City by the Lozier Motor Company, Fifty-sixth street and Broadway, New York. The structure will be 150 x 200 ft., and it will be fully equipped to handle all sorts of repair work and if necessary it can be utilized for manufacturing cars. The building will be completed as soon as possible and the equipment will be negotiated for at an early date.

John C. Short & Son, 51 Liberty street, New York, are financial agents for the Crocker Wood Pulp & Paper Company, Wilmington, N. C., which was recently organized with a capital stock of \$5,000,000, to acquire large tracts of timber in North Carolina to be utilized for making pulp in a mill to be erected near Wilmington. The company also owns 15,000 acres adjacent to its proposed mills and building operations will shortly be begun. The plans for the pulp and paper mill have not yet been completed.

The American Brake Shoe & Foundry Company, whose main offices are at Mahwah, N. J., has appropriated about \$4500 to be spent for furnaces and \$1000 for machinery equipment for a plant at Chattanooga, Tenn., which is to be used for the manufacture of crucible steel inserts for brake shoes. The building, which will be of brick and frame, will be 80 x 150 ft. and will cost \$5000.

The Kane Sliding Blind Company, Kane, Pa., whose plant was recently destroyed by fire, is rebuilding and is now in the market for swing saws, rip saws, planers, mortisers, tenoning machines, saw tables, molders, shapers, sanders and the like. According to inquiries in this market the company expects to close out its orders about December 1.

The firm of Kaltenback & Stephens, Brooklyn, N. Y., is having erected at 244-256 Sherman avenue, Newark, N. J., a large plant for the manufacture of silk ribbons. The plant will be two stories and 52 x 200 ft. Plans are also being prepared for a large power house which will be part of the plant. The general contract for the construction of the main building has been awarded to Ritter & Smith, Allentown, Pa.

The Mutual Chemical Company, 92 William street, New York, will shortly purchase equipment for a new factory to be erected in the West Bergen section of Jersey City. The building will be 204 x 290 ft., two stories, and it is estimated that it will cost about \$60,000.

Francis W. Brady, consulting engineer, 95 Liberty street, New York, is in the market for a number of small rotary air compressors and small rotary or centrifugal pumps, both to be driven at high speeds for direct connection to electric motors.

The plant of the Electrolytic Products Company at Elmwood and Hertel avenues, Buffalo, N. Y., to be used for the manufacture of automobile radiators by the electrolytic process, is nearing completion and will soon be ready for installation of equipment. Frank A. Abbott, secretary, 707 D. S. Morgan Building.

The Safferson & Weisberg Company, Lyons, N. Y., is planning to install a power and lighting plant at its new factory, now nearing completion, on Geneva street.

The Crosby Company, manufacturer of stamped sheet metal work, Buffalo, N. Y., has completed plans for a one-story brick foundry addition, 75 x 120 ft., to its plant at Pratt and William streets.

The mills of the Lake Champlain Pulp & Paper Company at Plattsburg, N. Y., recently destroyed by fire, are to be rebuilt of steel and concrete.

The New York Central Railroad Company has let the general contract for an engine house which it will build at Binghamton, N. Y., to A. E. Badgely of that city.

The Lumen Bearing Company, Buffalo, N. Y., is arranging to place a number of additional furnaces in its foundry plant at Syracuse and Lathrop streets and the New York Central Railroad Belt Line.

The Strootman Shoe Company, Buffalo, N. Y., John Strootman, president, 65 Carroll street, will build a three-story brick and steel factory, 60 x 100 ft., at Monroe and Genesee streets, to cost \$50,000. A large amount of improved shoe making machinery will be installed.

The Kelker Blower & Forge Company, Buffalo, N. Y., now located at Elk and Katherine streets, has secured a site on the Pennsylvania Railroad, at Milton and Harrison streets, and is having plans prepared for a new plant.

Contracts are soon to be let jointly by the city of Niagara Falls and the New York Central Railroad Company for construction of a steel viaduct over the New York Central Railroad at Tenth street, at the north end of the city of Niagara Falls. A. C. Douglass, Mayor, and Frederick Chormann, secretary Grade Crossing Commission, have the matter in charge.

Francis G. Ward, Commissioner of Public Works, Buffalo, N. Y., is receiving bids for the Bureau of Water for three steam turbine electric generators for the new water works pumping station foot of Porter avenue.

The city of Geneva, N. Y., has by referendum vote of its citizens decided to make improvements to its water works system to cost \$122,000, as follows: New pump and intake pipe, \$35,000; reservoir, \$30,000, and 20-in. water main, \$57,000.

The Onondaga Bed Mfg. Company, Syracuse, N. Y., will

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erect a four-story factory on East Water street, brick and steel construction.

Catalogues Wanted

The Edmunds & Jones Mfg. Company, Detroit, Mich., which makes a specialty of automobile lamps, desires catalogues from manufacturers of sheet metal machinery, plating, electro-galvanizing and enameling processes and electric lamp accessory devices. A note in the Detroit Machinery Market announces that the company intends to build a new plant.

Philadelphia

PHILADELPHIA, PA., November 1, 1910.

The local demand continues quite irregular and in a number of instances sales during the week show a decline. There is little doubt expressed that aggregate sales for October decreased as compared with September. Manufacturers of machinery and tools report a gradual decline in activity in connection with plant operations. Quite a number are operating at not over 50 per cent. of capacity and a portion of the product is for stock tools. Merchants report little fresh inquiry coming out, such as develops being principally for single tools for urgent delivery. No further railroad inquiry has been reported, neither have any open lists of requirements of a general nature developed.

The movement in second-hand equipment, either tools or machinery, continues very light, as also does that for second-hand power equipment. Very little improvement in the export demand is reported. The foundry trade remains dull; new inquiry for machinery castings is light and that for general gray iron castings is only fair. A spotty betterment in steel castings is reported, with the demand still far below normal.

The Lancaster Foundry Company, Lancaster, Pa., will begin operations at its new plant during the current week. The foundry has a capacity of 25 tons a day on light bench work. Its foundry equipment includes two 66-in. Byram Colliu cupolas.

Ballinger & Perrott, engineers, have plans in preparation for a four-story fireproof garage to be erected at 2314 to 2328 Market street. Plans will call for a structure 105 x 120 ft. The name of the owner is withheld.

The Latimer Supply & Machinery Company, Latimer Mines, Pa., is having plans prepared by the Schofield Engineering Company of this city for a three-story and basement warehouse which it proposes to erect at Hazelton, Pa.

The Penn Steel Casting & Machine Company, Chester, Pa., has just completed one of the largest orders for vanadium steel castings made in this country, involving the use of vanadium valued at \$25,000.

The Depot Quartermaster, U. S. Army, Philadelphia, will open proposals November 7 for furnishing and delivering either at Philadelphia or St. Louis, Mo., 5000 trunk lockers, with a right to increase the quantity 50 per cent. Samples and specifications may be seen at the Depot Quartermaster's office, Twenty-sixth street and Gray's Ferry road.

The Hess Steel Casting Company has acquired property in Bridgeton, N. J., and will engage in the manufacture of crucible steel castings. Arrangements are being made for a plant of an immediate productive capacity of 1800 tons of small castings a year. It is hoped to get the new plant in operation shortly after the first of the year.

A charter has been granted the International Automobile & Engine Company under the laws of Delaware, with a capital stock of \$10,000,000, to manufacture motorcycles, motorboats and airships. The incorporators are William D. Yarnall, Yeadon, Pa.; E. H. James, Sharon Hill, Pa., and S. C. Seymour, Camden, N. J.

The American Light, Heat & Power Company was incorporated last week under the laws of Delaware to generate, accumulate and furnish light and heat. The authorized capital stock is \$15,000,000. The Corporation Trust Company, American Equitable Building, Wilmington, is the Delaware representative of the concern and New York parties are said to be interested.

A transfer of a parcel of ground, 50 x 62 ft., on Cumberland street, below Richmond street, to one of the voting trustees of the William Cramp & Sons Ship & Engine Building Company is announced. It is understood that this has been acquired with a view of enlarging the foundry department.

Plans are being made for a three-story fireproof boiler and engine house and bottle washing department, to be built of reinforced concrete, at Sixteenth and Tasker streets, for the Dolfinger Dairies.

The American Culin Furnace Company, Sixteenth and

Arch streets, has an option on a tract of land at Elizabethtown, Pa., and is considering the erection of a plant for the manufacture of its furnaces at that place.

The S. P. Stevenson Company, Chester, Pa., manufacturer of cold storage doors, has had plans completed and has under consideration the erection of a fireproof addition to its machine shop. While it is not yet determined when operations will be started we are advised that as soon as the work of erection is begun the company will be in the market for the necessary machine tool equipment.

The Newton Machine Tool Works, Inc., has sufficient business on its books to keep it actively engaged for three or four months. New business develops slowly, although it is believed that a betterment is in sight. It is completing a shipment to a large Western railroad, consisting of both vertical and horizontal milling machines, slotting machines and cold saws. The bulk of the recent deliveries, however, have been heavy horizontal milling machines and cold saw cutting off machines.

Chicago

CHICAGO, ILL., November 1, 1910.

There has been a very gratifying improvement in the past week in the number of general inquiries received by Chicago dealers. While no rush of business has developed and the volume of orders is below the average the fact that there are more customers inquiring for tools is taken as an indication that the machinery-using industries are gaining more confidence. The gasoline engine manufacturers have been doing very well this summer, especially those who make the smaller sizes of engines for the agricultural trade. The demand has been growing at a remarkable rate in recent years for small stationary agricultural engines, and the manufacturers of these engines are steady buyers of tools. Gasoline traction engines are also coming into general use in place of the steam engines sold by the threshing machine manufacturers. While traction engines have never been popular for work in the field, like plowing, on account of the trouble of supplying coal and water to a steam engine, the manufacturers of gasoline engines for this work seem to be making considerable progress. The International Harvester Company is equipping a large plant in Chicago for the manufacture of gasoline tractors, and other large companies are going into the business on an extensive scale. The gasoline engine requires more finishing with machine tools than any other machine used on the farm.

Chicago dealers who handle special lines of tools for the general trade have done better the past year than those who specialize on heavier machines and tools. The automobile business has dropped out of the reckoning as a market and the railroads have been very light buyers. The loss of these two important lines of trade has proved discouraging to many houses which have taken an active part in the railroad and automobile field.

Some of the railroads are pursuing a policy which has created a good deal of feeling among machinery dealers. The lists of the Chicago, Burlington & Quincy and the Chicago & Northwestern were open to all the dealers and manufacturers and the business was apparently placed without favoritism and in a manner that was satisfactory to the trade. Other large railroad systems, however, have confined their inquiries to one or two houses only and have refused the general trade an opportunity to bid.

The Shotwell Mfg. Company, Chicago, has plans prepared for a four-story manufacturing building, 66 x 189 ft., to be erected at Adams and Morgan streets.

The W. H. Howell Company, Geneva, Ill., advises that its entire plant, with the exception of its foundry, was destroyed by fire on October 23, and that it has not been decided whether the plant will be rebuilt at Geneva or the entire business moved to another location. The company manufactures sad irons.

The Joliet Mfg. Company, Joliet, Ill., has purchased two pieces of land adjoining its present property, which gives it a frontage of 750 ft. on the Rock Island tracks. No building plans have been perfected at present, but in the spring the company will probably take up the matter of extensions and other improvements. The land will be used in the meantime for the storage of material.

The Stover Engine Works, Freeport, Ill., has recently completed the erection of an addition, part of which will be used as an office and the remainder for the manufacture of gasoline engines.

The Brigham Brass Mfg. Company, Chicago, has been incorporated with \$50,000 capital stock for the manufacture and sale of brass and brass products. The incorporators are

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Silas H. Brigham and Milard S. Fegan, both of Waukegan, Ill.

The Boehn Mfg. Company, Chicago, has been incorporated with \$10,000 capital stock to manufacture excavating and hoisting machinery by J. C. Boehn, N. L. House and Louis J. Dionne, 7505 East Seventy-third place.

The Forsyth Brothers Company, Chicago, railroad supplies, is negotiating for the purchase of a tract of land upon which it will erect a manufacturing plant of about 15 one, two and three story buildings. Grossmann & Proskauer, 84 Dearborn street, are the engineers in charge, and are now taking figures for the erection and equipment of one of the buildings which is to be erected this fall. The company is now located at 213 Institute place.

Frank A. Hecht, Chicago, has purchased the vacant property fronting 328 ft. on Throop street and between Congress and Harrison streets, on which he will immediately begin the erection of a manufacturing building 112 x 328 ft., to be occupied by the Kaestner & Hecht Company, elevator repairs and supplies.

The Kling Brothers Boiler Works, Chicago, is receiving bids through Grossmann & Proskauer, structural engineers, 84 Dearborn street, for the erection and equipment of a machine shop and foundry 160 x 250 ft. and a forge and power house 60 x 80 ft., one and two stories.

The Modern Parlor Furniture Company, 664 West Division street, Chicago, is receiving figures through Grossmann & Proskauer, 84 Dearborn street, for the erection and equipment of a factory and warehouse four stories, 105 x 125 ft.

The Howell Mfg. Company's plant, Geneva, Ill., was destroyed by fire October 24. The loss is \$200,000.

The elevator owned by the E. R. Ulrich Company, Buffalo, Ill., was destroyed by fire October 17. The loss is estimated at \$20,000, partially covered by insurance.

The city of Joliet, Ill., is planning to have separate water works systems for the east and west side on a high and low pressure system, in place of the present plant.

The Wright Carriage Body Company, Moline, Ill., certifies to an increase of capital stock from \$100,000 to \$150,000.

The Patent Novelty Company, Fulton, Ill., certifies to an increase of capital stock from \$100,000 to \$150,000.

The Ottumwa-Moline Engine & Pump Company, Moline, Ill., has been incorporated; capital stock, \$100,000; incorporators, J. M. Johnston, R. A. Clifton and Jay U. Barnard.

New England

BOSTON, MASS., November 1, 1910.

The convention of the National Machine Tool Builders' Association at New York last week afforded an excellent opportunity to get a grasp on the business situation and every one compared experiences and opinions as to the future. As a rule, the members and others who were attracted to New York by the meetings expressed the belief that an improvement is to be anticipated. The indications are that the railroads will do more buying of machinery and other shop equipment. Recent inquiries would seem to prove that such is the case. Boston dealers received more favorable reports from the machine tool builders of the Middle West. Few signs of discouragement were in evidence, though complaint of collections were heard. On the whole, the great gathering served to stimulate manufacturing for stock, a movement which is already strongly under way.

The Boston Fire Department has prepared plans for its new repair shops, which will replace those recently burned. The building will occupy the site of the old structure on Albany street and will be four stories instead of three, and there will be a large boiler room. An elevator will be installed to carry the heaviest fire apparatus. The estimated cost is about \$96,000. A few machine tools were salvaged after the fire, but practically all of the equipment will have to be replaced. The old machinery was practically obsolete. The department has asked for bids on a few tools which are imperatively needed. No appropriation for equipment has been made.

The Boston & Maine Railroad has an expert engineer at work on plans for the proposed \$2,500,000 repair shops. While no definite decision as to location has been announced it can be stated officially that the shops will not be located at Readville, on the New York, New Haven & Hartford system, as reported. The probability is that they will be at West Somerville, where the initial unit of repair shops is already erected. At all events, the plant will be on the Boston & Maine system and not on that of its controlling company, the Consolidated.

The McCrum-Howell Company, Norwich, Conn., will absorb five competitors in boiler, radiator and vacuum clean-

ing apparatus, as follows: Model Heating Company, Philadelphia and New York, boilers and radiators; Cameron, Schroth, Cameron Company, Chicago, jobber of radiators and boilers; American Air Cleaning Company, Milwaukee, Wis.; Vacuum Cleaner Company, New York, and Sanitary Devices Company, San Francisco. The statement is made in connection with the consolidation that the McCrum-Howell Company, with its present business, will control 80 per cent. of the stationary vacuum cleaning industry of the United States, including basic patents. The company will increase its capital stock from \$3,000,000 to \$7,000,000, the new securities to be divided between common and preferred, making a total of \$3,500,000 of each. About one-half of the new money will be employed in effecting the consolidation.

The Interstate Commerce Commission has compromised, temporarily, on the matter of demurrage rules for New England, by establishing a 48-hour limit for all freights, excepting coal, forest products, grain and grain products, for which the limit will be 72-hours. A demurrage bureau will be established at Boston to investigate the subject further during the six months following December 1, after which permanent rules will be laid down.

The Simplex Tool & Supply Company, Boston, Mass., has added to its products a line of high speed steel taps and high speed steel punches, manufactured of a special tungsten steel which hardens at a low temperature, combining the durability of high speed steel with the toughness of the ordinary tool steels. The company has just taken over several manufacturing properties, including the U. S. Gas Furnace Company, Providence, R. I. It is putting on the market a line of furnaces, made interchangeable for gas or fuel oil, the only difference being in the burner. H. B. Eaton is president of the company; F. A. Stoddard, treasurer, and William H. Stoddard, general manager. The present office is in the Safe Deposit & Trust Company Building, 201 Devonshire street.

The new plant of the Stanley Machine Company, Beverly, Mass., manufacturer of combustion engines, will consist of a two-story brick factory, 49 x 120 ft., with a one-story wing, 18 x 38 ft.

The Rhode Island Company will double the capacity of its Manchester street power station, Providence, R. I., at an estimated cost of \$300,000. A steam turbine will be installed with minimum capacity of 13,500 hp. and a maximum of 20,000 hp. New coal hauling equipment will be installed, increasing capacity from 30 to 100 tons per hour.

Additional improvements announced by the New York, New Haven & Hartford Railroad are nine new steel bridges in New Haven and its suburbs, replacing wooden structures.

The Geo. H. Bushnell Press Company, Thomsonville, Conn., manufacturer of presses and automobile parts, is developing a department for the manufacture of a new type of automobile, having three wheels, for use for pleasure or commercial purposes, or both. It is the design of Maxim Karminski, a French engineer, and Charles Peters.

The Central Oil & Gas Stove Company, Gardner, Mass., will erect two buildings, one 60 x 200 ft., the other 40 x 60 ft. The foundations will be put in this fall and the work of construction will proceed in the spring.

The Union Mfg. Company, New Britain, Conn., has bought the business of the Cincinnati Chuck Company, Cincinnati, Ohio, and is moving the machinery and tools to New Britain. The Cincinnati Company, which was organized in 1907, will wind up its corporate existence.

Cleveland

CLEVELAND, OHIO, November 1, 1910.

Reports regarding the outlook in the machinery trade are quite encouraging. Many manufacturers in metal working lines are getting a better volume of orders for their products than for some time and a further improvement is looked for immediately after election. Makers of general machinery are making little complaint regarding conditions. Their plants are generally busy and orders are being received in fairly good volume. The demand for machine tools is still somewhat quiet, but an improvement is looked for early this month. Dealers are getting a fair volume of scattering orders, but they are largely for single tools. It is believed that if general conditions continue to improve, as expected, manufacturing plants that have been holding back will soon come into the market for machine tool equipment. Railroad buying in this market is still quite limited, but indications point to a better demand from this source shortly. Late reports from the automobile manufacturers are quite encouraging. Some of the plants are gradually making additions to their working forces and a good volume of sales is expected during the coming year. Makers of refrigerating machinery report a good demand for their products. The

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demand for blowers is quite active. Boiler and tank makers report an improvement in orders.

In the foundry trade the demand for castings has fallen off somewhat, but plants are generally quite busy. A better volume of orders is expected after election. The demand for foundry equipment is not active.

The Cyclone Drill Company, Orrville, Ohio, reports a very good demand for well drilling and prospecting machinery. The company's business during September exceeded that of any previous month of the year and its October orders were equally large if not in excess of those in September.

The Great Lakes Engineering Works, Detroit, is preparing a list of the machine tool equipment for its new ship-building plant at Ashtabula, Ohio, which will be bought shortly. Considerable machinery will be required, which will be mostly motor driven. The company is also preparing its specifications for equipment for lighting and the distribution of power. The heavier machinery, including cranes, large generators, air compressors, stokers, and pumping machinery for the dry dock, have already been bought. The erection of the structural steel for the buildings is just being started by the Lackawanna Bridge Company, which has this contract. It is expected that the plant will be ready for operation in the spring. The principal buildings will be a power house, 90 x 100 ft.; blacksmith shop, 60 x 90 ft., one story; storage building, 60 x 90 ft., two stories; joiner shop, 50 x 250 ft., two stories; machine shop, 160 x 300 ft., one story.

The Cleveland Foundry Company has let contracts for two buildings which will be the start of a large plant that the company intends to build on a new site recently purchased on Ivanhoe road. One building will be 60 x 170 ft., two stories, and the other 20 x 80 ft. Both will be of brick and steel construction. The Forest City Steel & Iron Company has the contract for the steel work.

Extensive dock improvements, involving an expenditure of \$300,000, are planned by the Erie Railroad along the Cuyahoga River in Cleveland. Reinforced concrete docks will be built, on which will be installed a coal handling plant.

The Suspension Roller Bearing Company, Sandusky, Ohio, will erect a building, 60 x 350 ft., one story, of brick construction, plans for which are being prepared by the Osborn Engineering Company, Cleveland. The company will buy brass foundry equipment, stamping machines and other machinery and power equipment, probably consisting of three 25-hp. gas engines. E. A. Boyer is secretary and treasurer of the company.

The American Shipbuilding Company has broken ground for further additions to its plant at Lorain, Ohio. These will include a machine shop, foundry and pattern shop. The foundations will be put in at once, but the erection of the buildings may be delayed until early spring.

The American Tire & Rubber Company, Akron, Ohio, capital stock \$200,000, has purchased the Aetna mill property in that city and will at once begin the erection of a plant for the manufacture of automobiles and other vehicle tires and a general line of mechanical rubber goods. The company has elected officers as follows: President, Adam Duncan; vice-president, Gilbert C. Waltz; secretary and treasurer, F. L. Kryder; superintendent, W. J. Yeager.

The Ford Plate Glass Company, Rossford, Ohio, has purchased a 20-acre site adjoining its present plant, and it is announced that plans are being prepared for extensive additions that will nearly triple the company's present capacity. These additions will be erected early next spring.

Indianapolis

INDIANAPOLIS, IND., November 1, 1910.

The Furnas Office & Bank Fixture Company, Indianapolis, whose plant was recently destroyed by fire, has taken out a building permit for a brick structure at Cornell avenue and Eleventh street, to cost \$25,000.

The Sterling Wired Box Company, Indianapolis, has been incorporated with \$10,000 capital stock, to manufacture boxes. The directors are Jefferson Caylor, H. A. Patterson and Joseph Patterson.

The Star Novelty Company has been incorporated at Indianapolis with \$10,000 capital stock, to manufacture novelty goods. The directors are W. W. Williams, G. W. Williams and Charles Sheperkoter.

The Bamboo Lath Company, Indianapolis, has been incorporated with \$50,000 capital stock, to manufacture lath. Cane stalks are split and woven in strips 3 in. wide, 10 to 16 ft. long. The directors are Conrad Bender, Herman H. Mayer and Louis Beidel. Mr. Bender is the inventor of the machinery used. The factory will be at 375 West Fourteenth street.

Ralph Beaton, receiver for the White River Light & Power Company, has been instructed by the court to sell

on November 19 the dam in course of construction across White River, near Noblesville, Ind. The minimum price has been set at \$190,000.

The City Council of Shoals, Ind., is investigating plans for a municipal electric light and water works system.

The Thomas Aerial & Flying Machine Company, Evansville, Ind., has been incorporated with \$50,000 capital stock, to manufacture flying machines. The directors are Herbert B. Thomas, Charles F. Diefendorf, August Peltz, W. E. Kimbrough and Peter Parry.

William J. Nicholson and Jacob S. Spiker of Vincennes, Ind., have secured a 35-year franchise for a water works plant at Bicknell, Ind.

The Central Engineering & Construction Company has been incorporated at Indianapolis, Ind., by E. L. Powers, M. W. Addy and E. M. Powers.

The Central Closet Mfg. Company has been incorporated at Kokomo, Ind., with \$75,000 capital stock, to manufacture sanitary appliances. The directors are George A. Harper, J. W. Johnson and A. A. Charles.

The Hill-Tripp Pump Company, Anderson, Ind., has increased its capital stock from \$30,000 to \$100,000.

The increase of capital stock of the Hartman Mfg. Company, Vincennes, Ind., from \$25,000 to \$50,000 is for the purpose of enlarging the plant, which manufactures cultivators, harrows and other farming implements. The directors are Edward Watson, Eugene Hack, William Willmore, W. H. Vollmer and Louis A. Meyer. W. H. Willmore is superintendent and general manager.

The Backstay Machine & Leather Company, Union City, Ind., recently incorporated with \$120,000 capital stock, advises that it will manufacture a backstay machine and leather trimmings for buggies and automobiles.

Cincinnati

CINCINNATI, OHIO, November 1, 1910.

With the exception of an increase in the number of inquiries being received there is little change in the machine tool situation. No large orders were placed last week, but the regular day to day business was fair. The automobile industry did not furnish as much encouragement as was anticipated, but after the political situation clears up both the automobile manufacturers and railroads are expected to do much heavier buying.

A few of the foundries are experiencing another temporary dull period; others are running along as usual. Second-hand machinery dealers have made some nice sales lately, but business is not up to the regular standard with them yet.

Dr. George Kerschensteiner, superintendent of the public schools of Munich, Bavaria, made an address at the Hughes High School to the Cincinnati educational authorities on the afternoon of October 31. His subject was along the lines of broadening the scope of the continuation schools. The local school has thus far been devoted only to apprentices and foremen in machine shops, but the enthusiasm generated by Dr. Kerschensteiner's address indicates that other lines will be added to those now taught. In the evening a banquet was tendered the visitor at the Business Men's Club, where another address was made, principally to local manufacturers.

That the continuation school idea is spreading is evidenced by the invitation accepted by Prof. J. H. Renshaw, head of the Cincinnati Continuation School, who addressed the Schoolmasters' Club of Kentucky at Louisville October 28, and a school patterned after the local one will probably be established in Louisville very shortly.

The Associated Foundries of Cincinnati held an informal meeting at the Orpheum Restaurant on the evening of October 25. The plan of getting up a separate organization, whose function would be more of a social than business nature, was proposed and acted on favorably. The idea is to get the different foundry interests better acquainted in a personal way. The officers who were present at the meeting included the following: President, Henry Ritter of the Lunkenheimer Company; vice-president, Wm. Gilbert of the Buckeye Foundry; treasurer, S. M. Blackburn of the J. B. Morris Foundry Company, and secretary, J. M. Manley, secretary Cincinnati Metal Trades Association. After the dinner a theater party was enjoyed by the members and their friends.

W. F. Robertson, president of the W. F. Robertson Steel & Iron Company and of the Manufacturers' Club, had in charge a party of club members and their guests who left Cincinnati October 31 to inspect the large steel plant of the United States Steel Corporation at Gary, Ind. Among the machine tool people who went along were C. H. M. Atkins, H. T. Atkins, E. H. Hargrave, A. R. Betts, E. H. Bardees and R. K. LeBlond.

The Cincinnati Traction Company has commenced work

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on a large addition to its power plant in East End, recently mentioned. Two boilers of 500 and 1000 hp. respectively will be installed.

The Hudepohl Brewing Company, Cincinnati, has had plans prepared for an addition to its bottling works, 100 x 150 ft., two stories. Some special machinery will be installed in this addition.

It is reported that the Railway Materials Company, Chicago, will erect a large foundry addition to its plant at Toledo, Ohio.

The American Tool Works Company, Cincinnati, employing about 500 men, is busy in every department, and in some it has been necessary to put on a night shift. This indicates that general business conditions are healthy, as the company builds a diversified line of tools and draws its patronage from no particular industry.

The large flour mill of W. L. Snyder & Son, Springfield, Ohio, was destroyed by fire October 25. It is understood that it will be rebuilt at an early date.

The Louisville & Nashville Railroad Company is having plans prepared for building a large roundhouse and extensive yards at DeCoursey, Ky., a few miles from Covington.

The Tennessee Lumber & Coal Company, Cincinnati, is in the market for an 8 to 15 hp. steam engine to drive a small generator.

The Ripley Foundry & Machine Company, Ripley, Ohio, whose incorporation was recently noted in *The Iron Age*, has a capital stock of \$30,000 instead of \$10,000, as was stated.

The Bunting Brass & Bronze Company, making brass, bronze and aluminum castings, Alliance, Ohio, has begun work on a new plant at Toledo, Ohio, which will consist of a two-story main building, 54 x 200 ft., and four smaller structures. All the buildings will be of steel and brick construction.

The Ideal Electric & Mfg. Company, Mansfield, Ohio, announces that the Machinery & Supply Company, 61 Fremont street, San Francisco, Cal., has been appointed its Western agent. The Machinery & Supply Company now carries a line of Ideal apparatus covering the principal sizes. This line includes alternating and direct current generators, induction motors, both of the slip ring and squirrel cage types; special d. c. and a. c. elevator motors and also a complete line of direct current motors.

St. Louis

ST. LOUIS, Mo., October 31, 1910.

Business the past week has been dull according to the experience of most of the leading houses, but there is no gainsaying that a more confident feeling prevails among the machine tool men. Much is considered to depend on the outcome of the vote on the Missouri prohibition amendment, as investors are holding off projected improvements of various kinds until it is known whether real estate values are to be upset and many industries affected detrimentally, as would result if the prohibition advocates won.

Considerable disappointment is evident among the machine tool houses here at the manner of placing the Missouri Pacific order. It is felt this business could have been divided somewhat advantageously to the railroad and that, aside from this, the houses operating in the railroad's field should be shown some special consideration. Many well informed men contend the railroads could reduce their shop payrolls materially if they picked out the machines individually and were less disposed to lump the orders. The former course seems to be gradually winning favor among the stronger systems.

The Wissler Instrument Company, making a specialty of surveying instruments and kindred work, finds business moving in a fairly satisfactory way and is operating some 25 machines.

The Universal Welding Equipment Company, St. Louis, has been incorporated; capital stock, \$6000; incorporators, Francis Leiber, Ralph Parker and Gustav Cramer. The company will engage in the manufacture of machinery, &c.

The Brooks-Latta Automobile Mfg. Company, St. Louis, has been incorporated; capital stock, fully paid, \$150,000; incorporators, Charles E. Brooks, Charles Latta and Allan T. Latta. The company will engage in the manufacture of engines, automobiles, &c.

The woodworking shop of the Burlington Railroad at Hannibal, Mo., was destroyed by fire October 23. The planing mill and lumber yard were also burned.

The city of Granby, Mo., will install a water works system. Bonds will be issued to the amount of \$18,000 to cover the cost of construction.

The Calhoun Clay Products Company, St. Louis, has been incorporated; capital stock, fully paid, \$160,000. The

incorporators are Charles P. Tiley of Belleville, Ill.; R. F. Hickman of St. Louis County, Mo.; A. T. Grosbeck and others. The company will engage in the manufacture of clay products.

The Mexico Power Company, Mexico, Mo., has increased its capital stock from \$30,000 to \$300,000.

The Moon Motor Car Company, St. Louis, has increased its capital stock from \$175,000 to \$300,000.

The Carthage Sash & Door Company, Carthage, Mo., has been incorporated with a capital stock of \$20,000. The incorporators are James S. Ross, James W. Ross and Frank C. Ross.

The Sheffield Sash Weight & Mfg. Company, Kansas City, has been incorporated with a capital stock of \$7500. The incorporators are Solomon Stoddard, Geo. T. Cook and Geo. P. Pierce.

The Arcadia Valley Mfg. Company, St. Louis, has been incorporated; capital stock, one-half paid, \$25,000; incorporators, Frank Houlton of Glendale, Mo.; Julia E. Pfaff of Valley Park, Mo.; R. J. Burhen of Ironton, Mo., and others. The company will engage in a general planing mill business.

The Starrett Screen Company, Shelby, Mo., has been incorporated with a capital stock of \$30,000. The incorporators are R. L. Starrett, John T. Doyle and Ruby Starrett.

The National Stone Brick Company of Kansas City, Mo., has been incorporated with a capital stock of \$75,000. The incorporators are John D. King, James B. Turner and Dickson C. Collier.

The Camden Coal & Clay Company, which will mine and sell both coal and clay and also manufacture and sell clay products, has been incorporated in Arkansas with a capital stock of \$240,000. The incorporators are Dr. A. S. Garnett, D. Frank Clark and Philo N. French. The place of business will be at Lester, Onchita County, and the offices in Hot Springs.

The Luther Cotton Gin Company, Luther, Okla., is being formed. A site has been selected on the spur of the St. Louis & San Francisco Railroad.

The Scott Foster cotton gin, Roosevelt, Okla., was destroyed by fire October 22.

Baltimore

BALTIMORE, MD., November 1, 1910.

Generally speaking, trade conditions during October were hardly as favorable as in the previous month. While a pretty fair volume of business has been transacted in some lines, and in a few even an increase in orders booked is reported, the demand drags. Southern business in the iron and steel lines is reported less active; there is business pending, but constant revisions of programme keep bidders changing estimates to meet new requirements. Subcontracts on several of the new buildings under construction in this city are still held up. Contracts for engines and power piping in the Hochschild building have not been let, while a considerable amount of subcontract work on the Emerson buildings is still unclosed. The greater part of the business in sight for structural steel work is of the smaller class, although fabricators have a very fair share of work in hand. Machine tool builders have taken on a little more work, largely of a special character; machine tool merchants, however, report conditions quiet, with average business slightly below that for September. With winter approaching the demand for contractors' supplies and equipment is gradually declining, that for quarry work remaining the most active. The demand for machine shop and mill supplies shows little activity. Inquiries in nearly all lines have been less pronounced, and the trade generally hardly expects any marked improvement during the remaining months of the year. Industrial plants are fairly busy, largely on old orders, and in most cases are operating under full capacity.

The situation in the foundry trade is more settled; in a few instances the advance in wages recently demanded by molders was granted, in other cases plants are being operated with non-union men. A further difficulty in connection with union labor has developed, pipe fitters and helpers having made demands on employers for an advance of 50 cents a day for fitters, and 75 cents a day for helpers. If this advance is not granted they threaten to strike.

The Engineering & Contracting Company has been awarded the contract to build a garage at Third and Toone streets, for the George Guenther Brewing Company.

Fire destroyed the two-story saw and planing mill of H. L. Thomas & Son, 2601 Boston street, October 27. The

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loss is covered by insurance. The plant is to be rebuilt and equipped as soon as possible.

The Detrick & Harvey Machine Company reports the volume of business taken in October as exceeding that during the previous month, but still continues under normal. Inquiries are reported as a shade more active.

The Baltimore & Ohio Railroad has under consideration the erection of a repair shop, 50 x 300 ft., to be used for repair work in connection with steel cars. A. W. Thompson is chief engineer.

Bids on revised plans are being taken for the proposed new power house for the Southern Power Company, Greenville, S. C.

J. L. Parsons, general contractor, Washington, D. C., has awarded the contract for the structural steel work, about 1000 tons, for the new power house for the Capital Traction Company to the Phoenix Bridge Company, Phoenixville, Pa.

The Baltimore Bridge Company reports business quieter during the month. The contracts on hand are sufficient, however, to keep the plant fully engaged for some months. A fair volume of new work is pending, on which the estimating department is busy. The company has just completed the erection of a bridge over the Matina River in South America.

The Kirwan-Robirds Supply Company, contractors' supplies and equipment, notes a falling off in the demand from the railroads and general contractors. The quarry trade has, however, been quite good and October business compares favorably with that transacted during the previous month.

Friedenwald Brothers continue fairly active on general and special tools, a large proportion of which is for the export trade.

The Crook-Horner Supply Company has been delayed in the removal from 17-19 East Pratt street to its new warehouse and offices at 7-9-11 Balderston street, but now announce that the new quarters will be occupied about the middle of November.

Bartlett, Hayward & Co. report plans for the proposed addition to their machine shops at Scott and McHenry streets as entirely tentative and it is not known when work will be started.

Plans are being considered for the erection of a manufacturing building, on a beehive plan, for rental purposes to small manufacturers. The Consolidated Gas, Electric Light & Power Company is interested in the project, as are also the various trade bodies of the city. The rental plan includes the furnishing of power at reasonable cost, which would be supplied by the Pennsylvania Water & Power Company, which now distributes current in Baltimore from its McCall's Ferry plant on the Susquehanna River.

The Crown Cork & Seal Company has let the general contracts for the erection of the additions to its plant at Highlandtown. The contracts for elevators and heating and ventilation have not yet been placed. Considerable equipment of a varied character, including some tools, will be required for the new addition.

Announcement has been made by the Gas & Electric Company, Baltimore, of a purchase of a tract of land at Arlington, and plans for the erection of a distribution and repair plant at the new site; a large two-story building will be erected. The new location will facilitate the delivery of gas appliances and the making of repairs thereto, in many outlying districts of the city.

The McClintic Marshall Construction Company, Pittsburgh, Pa., has the contract for the steel work on the new shed for the Union Station, Pennsylvania Railroad. The roofing and skylight work has been awarded to the Brann & Stuard Company, Philadelphia.

Plans have been completed for the erection of a large plant to replace the old factory of Becker Bros. & Son, Lexington and Frederick streets, recently destroyed by fire. The new plant is to be three stories of mill construction, and will be equipped with modern machinery for the manufacture of packing boxes, including electric elevators and conveyors. An electric light plant is also to be installed.

The Chesapeake Iron Works reports the demand somewhat easier. A number of small contracts have been taken, including a steel frame shed for the Consolidated Gas, Electric Light & Power Company, a monorail system for the Baugh Chemical Company, and miscellaneous work for the Monumental Brewing Company. Trade in the South is reported quiet, although better than during September.

The Crook-Kries Company will furnish two Ball engines, one 80 and one 120 hp., direct connected to electric generators, for the Mercy Hospital, also two 150 hp. Ball engines to the J. J. Young Company, for general power purposes. This company has been appointed selling agent in the Baltimore district for the Richmond power vacuum cleaner, manufactured by the McCrum-Howell Company, New York.

The Monumental Sugar Refining Company, incorporated

under the laws of Delaware, with a capital stock of \$3,000,000, has been formed for the purpose of erecting and operating a sugar refinery in the vicinity of this city. It is proposed to erect large buildings of brick, iron and concrete construction, equipped with modern machinery, as soon as financial matters have been concluded. Electricity will be used for power purposes. The new plant will probably be located in the Canton district.

Announcement is made that the plans for the new 12-story warehouse, covering practically a block of ground at Baltimore and Liberty streets, for the Baltimore Bargain House, which are being prepared by Joseph E. Sperry, architect, will be ready by the end of next week. The building will probably be erected in sections and when entirely completed will cover 20,000 sq. ft. of ground.

The Baltimore Retort & Fire Brick Company is busy on general orders and is working on the development of a special system of utilizing waste heat from puddling furnaces, as well as boiler settings of special efficiency.

The T. C. Bashor Company has been awarded the contract for the heating, ventilating and power piping in connection with the new 18-story addition to the Munsey Building. It also has the contract for the heating and ventilation system of the Southern Electric Building and quite a few fair sized propositions are being figured on. The demand for boilers has been a trifle less active, but the plant continues quite busy with work in hand, which includes among other orders one for a quantity of 8-in. steel sewer pipe for New Jersey parties and two large tanks for the Miller Fertilizer Company of this city.

Detrich Brothers have been awarded the contract for the steel work in connection with the new buildings for the Crown Cork & Seal Company and also have orders for considerable steel work in connection with general improvements under way by the Baltimore Copper Smelting & Refining Company. They are busy in all departments. They have begun the work of clearing ground for a new structural shop and storehouse, 120 x 250 ft., to be erected in connection with their present plant, and will require several electric cranes, punch and shears, cold saw cutting off machines and other equipment.

Detroit

DETROIT, MICH., November 1, 1910.

The volume of construction contracts recently let all through this State and in adjacent districts has been large. Both the metal and woodworking industries show prominently in the list. Almost every day sees quite a batch of incorporation papers filed with the Secretary of State at Lansing, and there is a noteworthy absence of the usual promotion schemes as contrasted with legitimate companies for establishing manufacturing plants. Machinery of nearly every description is now in fairly good demand. One of the best selling lines, both for new and second-hand equipment, is in tools for sash and door factories, flooring plants and other shops specializing in woodwork for buildings. Good used or rebuilt machinery is becoming more scarce and almost as much can be obtained for it as for new.

Terrell's Equipment Company, at Grand Rapids, Mich., is planning the erection of a new factory building, 80 x 385 ft., for use in the production of steel shelving, lockers and other similar equipment for stores, vaults, factory stock-rooms, &c.

Bids will be taken until November 8 by the Board of Public Works, Grand Rapids, Mich., on two dynamos for an arc light system. The machines are to be motor driven on power supplied from the new steam turbine unit recently contracted for.

A one-story brick addition, 40 x 100 ft., is to be made to the plant of the Nichols & Cox Lumber Company, Grand Rapids, Mich.

Chain grate stokers are to be purchased early next week for the new municipal power and pumping station at Grand Rapids, Mich.

It is reported from Grand Rapids, Mich., that the Silverman Brass, Iron & Metal Company of that place is erecting a new two-story factory and warehouse building, 50 x 100 ft.

The Warren Motor Car Company, Detroit, has increased its capital stock from \$100,000 to \$300,000.

The plans of the Abbott Motor Car Company for a plant in Detroit have not yet been fully matured. Its present location is in Warren, Ohio.

E. M. Arnos and others are organizing a stock company at Olivet, Mich., to remodel the mill there into an electric power plant for furnishing light to the community.

Construction contracts were recently let for a two-story addition, 30 x 150 ft., and a new three-story shop building.

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100 x 100 ft., to be erected for the Detroit Forging Company, Detroit.

The Escanaba Lumber Company, Escanaba, Mich., is planning to erect a large mill, for which power and timber-cutting machinery will be required.

Construction contracts have just been let on a new factory building, the main part of which will be 45 x 130 ft., for the E. O. Bulman Mfg. Company, Grand Rapids, Mich.

It is reported from Alabaster, Iosco County, Mich., that the mills, warehouses and docks of the United States Gypsum Company recently burned there will be rebuilt.

The new addition to be made to the plant of Goodwillie Brothers, Manistique, Mich., will be 50 x 200 ft., equipped with power and woodworking machinery of the most modern design.

The Haney School Furniture Company, Grand Rapids, Mich., is preparing to erect a new two-story building.

The plans of the new shops to be built by the Copper Range Railroad at Houghton, Mich., call for buildings 36 x 106 ft. and 24 x 148 ft. All of the machinery is to be driven by electric motors.

The Auto Equipment Company, Detroit, has increased its capital stock to \$75,000.

It is planned to make extensive improvements, including the purchase of new machinery, in the municipal power plant at Marquette, Mich.

The Canadian trade of the Penberthy Injector Company, Detroit, has developed to such an extent that it will be necessary to considerably extend the manufacturing facilities afforded by its branch works at Windsor, Ont. Arrangements for an addition are now being made.

A new car house with repair equipment will be built in Lansing, Mich., by the Michigan United Railways. It is to be 130 x 180 ft.

It is reported from Saginaw, Mich., that arrangements have been concluded for the erection of the new plant which the Seely Auto Engine Company has been planning to locate there.

A plant for the manufacture of fruit packers' supplies will be established at Lansing, Mich., by the Michigan Bent Rim & Basket Mfg. Company, recently organized there by John Leentcaar of that place and Miles Monk of Lowell, Mich.

Articles of incorporation for \$30,000 have been filed by the Muskegon Steel Casting Company, Muskegon, Mich.

The Great Lakes Engineering Works, Detroit, is planning the erection of a large plant at Ecorse, Mich., next spring, for the building of marine engines. The company now makes marine engines and refrigerating machinery at its Detroit plant, but its capacity is too small for the growing requirements, and after the new Ecorse plant is built the Detroit plant will be used exclusively for making refrigerating machinery. The company reports a heavy demand for refrigerating machinery and its marine engine department is also well filled with work.

The Capitol Brass Works, Detroit, is completing an addition to its plant that will provide 30,000 sq. ft. additional floor space and about double its capacity. Another story has been added and an extension built to the main building. In addition to its present products this company will shortly begin the manufacture of a new line of water gauges and compression gauge cocks.

The American Blower Company, Detroit, is running its plant overtime to keep up with orders. The company reports a good volume of orders for blowers for various purposes and a heavy demand for engines for small lighting plants.

The Ireland & Mathews Mfg. Company, Detroit, makes very satisfactory reports regarding business conditions and the outlook for the future. The company's plant is well filled with work in all departments.

The Edmunds & Jones Company, manufacturer of automobile lamps, Detroit, Mich., is erecting a plant 65 x 200 ft., which will be fully equipped for sheet metal working machinery. The company is also building a power plant which will include a 250-kva. Crocker-Wheeler generator, direct connected to an Erie Ball high speed engine. A low pressure turbine will drive auxiliary equipment. The boiler room will contain two 125-hp. return tubular boilers fired by Jones stokers.

Pittsburgh

PITTSBURGH, PA., November 1, 1910.

There has seldom, if ever, been a time when the manufacturing plants in this district were kept busy with so few of the surface indications of activity in the booking of contracts. This makes the situation difficult to gauge properly, but it also affords evidence of an essential stability, which argues well for the future of the market. An uncommonly

large percentage of the orders recently placed here have been practically on a noncompetitive basis. Inquiries largely outstrip actual bookings, but conditions are not as uneven as they were; that is to say, it is not a case of good business with some dealers and very poor with others; most of them are obtaining about their normal share. In the line of shop equipment, machinery for forging and hot pressing, shearing, bending, punching, riveting, &c., sell about as well as anything, while there is a fair demand for hydraulic presses, accumulators, force pumps and auxiliary apparatus.

The Pittsburgh Machine Tool Company, now located on Darragh street, N. S., Pittsburgh, has purchased a site of ground, 95 x 250 ft., on the Pennsylvania Railroad, a short distance east of Pittsburgh, on which it will erect a new and modern plant, comprising several steel buildings, for the manufacture of lathes, planers and other iron working tools. Plans are now being drawn.

The plans of the Baltimore & Ohio Railway Company for additional shops at Keyser, W. Va., to provide facilities needed in the repairing of steel freight and passenger cars are to be carried into effect shortly. The first of the new buildings decided upon will be 50 x 300 ft. All of the machinery is to be electrically operated.

The Bessemer Limestone Company, whose product is used as flux for blast furnaces of this district, finds the facilities of its plant at Bessemer, Pa., inadequate to the requirements of the industry, and plans for enlargement are now under consideration.

A large warehouse, with equipment for the rapid handling of material, will be built at some point in the Southwest, probably Houston, Texas, by the National Fire Proofing Company, Pittsburgh.

J. Richard Kommer and C. E. Miller of this city are consulting engineers for the proposed water works improvements at East Liverpool, Ohio, which include a large steel standpipe, to be constructed back of the present high pressure reservoir. The pumping station is also to be removed to a better location and increased in capacity, with the probable replacement of some of the equipment by modern high duty machinery.

Tenders will be invited in the near future of material and equipment for the generating plant, holder, &c., to be erected by the Bluefield Gas & Fuel Company, Bluefield, W. Va. Plans are now in course of preparation.

The National Bolt & Nut Company, Pittsburgh, is preparing for a considerable increase in production by improvements in the arrangement of its plant, which include the installation of some new machinery.

Figures will be submitted in the near future by manufacturers of this district on the equipment of a municipal pumping plant at Benton, Pa., the construction of which was recently decided upon.

Chester & Fleming, engineers, whose offices are in the Union Bank Building, Pittsburgh, have in preparation plans for the mechanical filtration plant to be constructed at South Fork, Pa., for the South Fork Water Company. They have recently completed an addition to the pumping plant of the Charleroi Water Company, Charleroi, Pa.

At Martinsburg, W. Va., a large stone crushing plant, equipped with crushing rolls instead of the customary jaw or gyratory breakers, will be built by the National Limestone Company, of which C. P. Grimsley is manager.

The Wheeling Hinge Company, Wheeling, W. Va., is erecting three additional stories to its factory building, which is 75 x 125 ft. This will enable the company to increase its output materially.

Milwaukee

MILWAUKEE, WIS., October 31, 1910.

The past week has brought a good deal of business to local plants, particularly in the line of orders for heavy machinery. Among these are contracts for large pumping engines and hydraulic turbines, steam turbines, Corlious engines, sawmill machinery, rock and ore crushing outfits, cranes, conveying apparatus and electrical equipment both for large and small capacities. The market for shop tools is also becoming rather more active than it was early in the month; gasoline engines are selling well, and for factory supplies of various kinds there is an increased demand. In the quarters where the principal activity prevails, however, the conditions above noted seem to be taken as a temporary spurt of buying, and it is not felt that the situation has as yet settled down to any firm or regular basis of supply and demand.

The La Crosse Plow Company, La Crosse, Wis., is planning the erection of a new factory, 125 x 400 ft., but construction work will probably not be started before next spring.

The Lyons Boiler Works, De Pere, Wis., is erecting an

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addition to its power plant, 32 x 70 ft., to provide for increased boiler capacity.

Plans are being made for an addition to the forge shop of the Joseph Obenberger & Son Company, Milwaukee.

The Rotary Pump Company, organized by C. R. Gether and others, was recently incorporated here.

The power plant of the Darlington Electric Light & Power Company, Darlington, Wis., was recently burned. It will probably be rebuilt and remodeled for increased capacity.

The Beloit Lighting & Heating Company has been organized at Beloit, Wis., by Charles H. Jones and others, to manufacture apparatus for the production of gas from gasoline. Plans for a factory are reported to be under way.

If the project for the municipal power and lighting plant is carried at the November election in La Crosse, Wis., a battery of boilers. Corliss engine and an electric generator will be among the requirements in equipping the station. For the city water works an additional pump of 6,000,000 gal. daily capacity may also be provided.

Machinery for an electric light plant will probably be purchased in the near future by the village of Sun Prairie, Wis., which has already let the contract for a building.

Four new factory buildings, three of which will be 80 x 200 ft., and one 50 x 150 ft., are to be erected in the spring by the Egan Mfg. Company, La Crosse, Wis., for use in the manufacture of agricultural implements.

The Johnson Mfg. Company, Marshfield, Wis., which contemplated the erection of a new plant at Wausau, Wis., has decided to remain in its present location and build an addition to the factory there.

The McCrum-Howell Company's branch at Racine, Wis., will build a four-story addition to its plant for use in the manufacture of motors and other parts for vacuum cleaner outfits.

A new plant, including mixing mill, bag house and drying room, is to be built in Milwaukee by the United States Gypsum Company.

The Gardner Machine Company, Beloit, Wis., which is erecting a thoroughly modern plant, electrically operated, on a new seven-acre site secured at South Beloit, expects to occupy it before the end of November. L. W. Thompson, the secretary-treasurer, states that it is looking forward to a large increase in output. As the new works are just across the line in Illinois, although the company's postoffice address will remain as above, a charter has been secured from that State, the incorporation being for \$100,000.

The Southern Wisconsin Power Company, Madison, Wis., whose plans for a new hydroelectric power station have previously been reported, will practically duplicate at Prairie du Sac, Wis., the equipment of its Kilbourn plant, which contains four General Electric alternating current generators of 6000 kw., driven from hydraulic turbines built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

Work has been started on an addition to the foundry of the Rundle Mfg. Company, Milwaukee.

It is stated by George Challoner of the Wilkin-Challoner Company, Oshkosh, Wis., that Rush C. Brown has become associated with that company as vice-president. Mr. Brown, who was formerly designer for the E. B. Hayes Machinery Company, is a practical woodworker of long experience and will be given entire charge of the manufacturing end of the business.

The Luther Grinder Mfg. Company, Milwaukee, has increased its capital stock to \$100,000.

The Independent Electric Mfg. Company, Milwaukee, has doubled its capital stock.

The T. L. Smith Company, Milwaukee, is now represented at Louisville, Ky., by the Urwick Machinery & Supply Company, which has a large established trade in contractors' equipment.

In connection with its new plant at Beloit, Wis., the Berlin Machine Works will erect a three-story office building 55 x 120 ft.

It is reported from Campbellsport, Wis., that the Campbellsport Electric Light & Power Company will build a new power station equipped with a gas producer plant, gas engines and two new electric generators. The equipment at present in service comprises a Fort Wayne alternator driven from a water turbine furnished by James Leffel & Co., Springfield, Ohio.

C. J. Anderson is installing machinery for a foundry and machine shop at Marinette, Wis., having decided not to continue at his former location in Menominee, Mich.

The authorities at Green Bay, Wis., have under consideration a plan for taking over local water works, which are owned by a private corporation, and increasing their capacity.

It is reported from Wilton, Wis., that Carl C. Vogel has been granted the franchise to install an electric plant there. With others he has formed the Wilton Light & Power Company, which will be incorporated for \$5,000.

The Hardwood Products Company, Neenah, Wis., has broken ground for the erection of a new factory building, 90 x 190 ft., three stories; a boiler house, two dry kilns and a two-story warehouse. Details of equipment to be installed have not been decided upon, but the company expects to use two 250-hp. boilers, and is now considering the advisability of using electric motive power for operating its machinery.

The Racine Iron & Wire Works, Racine, Wis., advises that it expects to be located in its new factory about November 15. A portion of the machinery has already been ordered, but additional equipment will be ordered from time to time as requirements demand.

The Wisconsin Engine Company, Corliss, Wis., reports among its recent shipments the following: J. M. Kohler Sons Company, Sheboygan, Wis., one 24 and 46 x 42 in. horizontal cross compound direct connected Corliss; Illinois Steel Company, Milwaukee, Wis., one 32 and 56 x 48 in. tandem compound heavy cutting rolling mill; Girard Iron Company, Girard, Ohio, one 28 x 60 in. simple heavy duty rolling mill and one 30 x 60 in. simple heavy duty Corliss; Jones, Coates & Bailey, Chicago, Ill., one 20 x 42 in. simple heavy duty Corliss.

Toronto

TORONTO, October 29, 1910.

Reports as to the condition of trade in the machinery business continue to be favorable. As the time draws nearer for the closing of navigation on the upper lakes work on orders yet to be delivered by Ontario manufacturers to Western customers receives chief attention. Also, with the beginning of winter at hand, machinery, engines, &c., for the Porcupine, Elk Lake, Gowganda and other northern Ontario mining districts beyond the reach of the railroad are being pushed to completion in order that they may be sent forward as soon as the snow roads are formed. It is next to impossible to get a heavy mining plant to its destination in these camps at any other season, so bad is the state of the roads. There is a good, steady demand for workshop machinery of all kinds.

Tenders will be received up to November 8 by the Mayor of Toronto for the supplying of the cast iron lanterns and pillars required for the city's hydroelectric lighting system.

Swanson's, Ltd., manufacturer of stumping machines in Bobcaygeon, Ont., has decided to move to Lindsay, Ont., and extend its business to a capacity of 500 machines a year.

A planing mill is being added to the box factory of the Carew Lumber Company, Lindsay, Ont. It will soon be ready for the machinery.

New machinery to the value of about \$10,000 is to be put in the works of the American Road Machine Company at Goderich, Ont., which company is one of the concerns in the latest merger centering in Hamilton, Ont.

The Garlock Packing Company has purchased the factory in Hamilton, Ont., formerly occupied by the Ontario Tack Company. It is said that the only vacant factory in Hamilton at present is that of the Jackson Typewriter Company, and several offers for its purchase have been declined.

A demand for garbage incinerators is developing in Canadian cities. Toronto has decided to establish some new modern incinerators. A sanitary engineer has been retained to report as to the locations and capacities of the required plants. The City Council of Ottawa is still considering the question of which particular manufactory to place its incinerator order with. The superintendent of garbage collection at Hamilton, Ont., says that the time has come when an incinerator must be provided for the service in that city.

The ratepayers of Harriston, Ont., have voted in favor of the town giving a free factory site and taxation privileges to the Canada New Shoe Company.

The power house of the Renfrew Electric Light Company at Smith's Falls, Ont., was burned last week and the machinery was badly damaged.

Letters patent incorporating the Windsor Superior Mfg. Company have been granted by the Ontario government. The business authorized is manufacturing and dealing in wares of every description composed of metal. The capital stock is \$100,000, and Windsor, Ont., is the headquarters of the company.

The National Carburetor Company has been incorporated under Ontario laws to deal in and manufacture carburetors, water, air and gas mixtures, automobiles, motorboats, &c. The capital stock is \$25,000, and the principal place of business is to be at Ottawa, Ont.

A provisional agreement has been signed by the Industrial

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Committee of Woodstock, Ont., and John B. Parter, president of the Maximilian Machine & Tool Company of Buffalo, in which it is agreed that the Maximilian Pneumatic Tool Company will be organized under the laws of Ontario to establish works and carry on a manufacturing business in Woodstock, the town to give certain privileges, and Woodstock people to take \$15,000 stock in the new company. The total capital stock is to be \$100,000. Two hundred hands are to be employed after the first year. The company will manufacture a pneumatic riveting machine for bridge work, boiler work and steel architectural work. Woodstock will be the headquarters for foreign shipments. A by-law will have to be passed and confirmed by the ratepayers to give effect to the agreement.

A steel and concrete bridge, 2700 ft. in length, is to be constructed over the Ottawa River at Mattawa, Ontario, at a cost of \$3,000,000. Stewart & Hewitson of Port Arthur, Ontario, have been awarded the contract.

The Canada Metal Company has purchased a manufacturing site on Frazer avenue, Toronto, and will at once erect a two-story brick factory to cost about \$40,000. The company will also build a plant at Winnipeg, Man. W. G. Harris, Toronto, is president.

The South

CHATTANOOGA, TENN., October 31, 1910.

Sales of machinery continue rather light for this season of the year, but there is a firm undertone to the market and conditions as a whole are relatively favorable. The railroad buying mentioned some weeks ago, which has been of a decidedly miscellaneous character, gives promise of developing further along the line of equipment for repair shops, as improvements long contemplated are now nearly due. Purely industrial lines, including the coal and ore carrying and the logging roads, are not affected by this situation, as they have been spending a good deal of money on their maintenance departments right along; but from these sources a steady run of buying may be looked for which will materially help to swell the total volume of business transacted. There is also to be noted all along the line a more favorable sentiment in relation to the future among manufacturers and jobbers as well as dealers scattered through a wide stretch of territory, as the result of the greater interest shown at various factories, mills and other industrial plants in pending propositions.

In connection with the enlargement of its shops in northern Alabama the Louisville & Nashville Railroad Company will build an electric power plant of considerable capacity. The plans, however, have not yet been fully worked out.

Negotiations are reported to be under way at Newport, Ky., for a direct current generator of 300 kw., engine driven, to be installed by the Newport Rolling Mill Company.

An elevated steel tank of 75,000 gal. capacity and the complete equipment for a water works system are to be purchased at some time during the coming winter by the municipality at Boaz, Ala.

One or more pumping units will be needed for installation in the near future at Wrightsville, Ga., where the water works station recently burned.

The Belton Marble & Granite Company has been organized by J. L. Browning and others to operate a quarry in the vicinity of Belton, S. C.

The machinery in the new factory building which the Champion Wire & Iron Works is erecting at Louisville, Ky., will be electrically operated, and this system of motor drive is to be extended as further manufacturing facilities are provided.

A new plant is to be erected by the Holland Blow Stave Company, Decatur, Ala., to replace the one destroyed by fire.

The public service plant at Live Oak, Fla., which was subsidiary to the Live Oak Mfg. Company, has been acquired by A. L. Humphreys and will be enlarged in capacity.

It is reported from Memphis, Tenn., that F. B. Fischer, New Madrid, Mo., contemplates the construction of a large plant there for the manufacture of carriage and wagon stock and has secured an option on a site for the purpose.

The purchase of the complete equipment for an electric power plant of 75 kw., engine driven, is under consideration by the city officials at Richland, Ga.

Preparations are reported to be under way at Hartsells, Ala., for a new foundry and shop to be erected for the Hartsells Machine Company.

The American Mfg. Company, Chattanooga, Tenn., is arranging for increased production facilities in place of the machinery destroyed by fire some weeks ago.

An engineering firm has been engaged by the city of

Kirkwood, Ga., to prepare plans for a pumping plant and water works system.

Motor driven crushers and other equipment will be required in the near future by the Belmont Trap Rock Company, which is developing a quarry near Herndon, Va.

The Corinth Chair Company, Corinth, Miss., is planning the erection of a new factory, the location of which will, however, probably be nearer the coast.

The Greenville-Knoxville Railroad, Greenville, N. C., has under consideration plans for terminal facilities at that place which include the construction of woodworking machine and boiler shops for the car and locomotive repair plant. No definite action in the matter has, however, as yet been taken.

R. Lee Reaves, I. H. Dungan and T. E. Bobbitts, Humboldt, Tenn., are contemplating the construction of a hydro-electric plant. Mr. Reaves is the engineer in charge.

Southern Texas

AUSTIN, TEXAS, October 29, 1910.

An increase in the demand for electrical machinery is reported from all parts of the Southwest and Mexico. In South Texas an unusually large number of electric light and power plants have been installed during the last several months and others are constantly being planned. Hydro-electric projects are receiving much attention on the part of investors in this territory. The rapid increase in population, not only in the towns and cities but in the rural districts as well, is creating a demand for cheap power. An era of interurban electric railway construction is also about to be entered upon in Texas. Several projects of this kind are being actively promoted.

J. P. Ward and William Gebhardt have adopted plans for their proposed canning factory at San Antonio. They will invest about \$15,000 in machinery.

The Livingston Light Company, Livingston, Texas, will make improvements to its plant. It has increased its capital stock from \$2000 to \$15,000.

The Sherman Cotton Mills, capital stock \$100,000, will install machinery for the manufacture of cotton goods in a building that it recently acquired at Sherman, Texas.

William Willig recently started construction work on a new iron foundry at San Angelo, Texas. He will invest about \$30,000 in the enterprise.

The proposition for the town to issue \$45,000 bonds to purchase the water works system and electric light plant at Georgetown, Texas, was carried at a recent election. The town will enlarge and otherwise improve the plants, it is announced.

In a recent election held at Ballinger, Texas, it was voted to issue \$16,000 bonds for enlarging and improving the water works system.

The town of Rogers, Texas, has voted \$14,000 bonds for the installation of a system of water works.

Captain A. B. Wolvin, Duluth, Minn., president of the Texas City Transportation Company, announces that the stockholders of that company have authorized the additional expenditure of \$1,500,000 for improvements of its property at Texas City, near Galveston. Additional machinery will be installed upon the docks for the quick handling of freight, including electric cranes. Another steel and concrete warehouse, 100 x 750 ft., will be erected. The company will also install an electric light plant, a water works system and other public utilities for the town.

The Seco Pressed Brick Company, which was recently organized with a capital stock of \$40,000, will erect a manufacturing plant at D'Hanis, Texas.

Roger B. Chase is preparing to install about 100 hp. hydraulic works near Canelas, State of Durango, Mexico.

The Gila Valley Electric, Gas & Water Company, Safford, Ariz., recently began the construction of the new reservoir in Fry's canyon for its new water works system. The reservoir will have a capacity of 60,000,000 gal. A pipe line will be laid from the reservoir in the mountains to Safford.

The construction of electric transmission lines through the Mimbres River valley by the Deming Electric Company, Deming, N. M., is causing the installation of many irrigation pumping plants by farmers who derive the power for operating the pumps from these lines. The motors of these plants are from 5 to 40 hp.

The Border Gas Company, Laredo, Texas, in addition to laying a natural gas pipe line from the gas field at Beiser to Laredo, is running a line down the Rio Grande valley for ten miles for the purpose of supplying the irrigation pumping plants with gas for fuel.

The rapid development of sugar cane growing in south Texas is causing a considerable demand for machinery for new sugar mills that are being erected and proposed in

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that region. In the lower Rio Grande valley where the sugar cane acreage was more than doubled this year the erection of several new mills is proposed.

The water works plant of the International Water Company at El Paso was formally taken over by that city October 27. Improvements will be made to the property.

The electric power station of the Galveston-Houston Interurban Railway Company is being erected on the bank of Clear Creek, between Houston and Galveston. The plant will be equipped with steam turbines and two 3000-kw. machines. The boilers will be three in number, each of 500-hp.

W. T. Eldridge and associates will rehabilitate the large paper mill at Sugarland, Texas, and install new machinery for the manufacture of paper from white birch pulp. The mill was originally planned to utilize sugar cane bagasse in the manufacture of paper.

The Livingston Mfg. Company will enlarge and otherwise improve its electric light plant at Livingston, Texas.

Preliminary steps have been taken by the City Council of Paris, Texas, toward the installation of an electric light and power plant and water works system. It is planned that the water works pumping plant shall have a daily capacity of 1,000,000 gal.

A sewerage purification plant and sewer system will be constructed at Plano, Texas. F. H. Lancashire of Dallas has prepared the plans for the proposed improvements.

Considerable activity in installing irrigation pumping plants on shallow wells in the upper Pecos River valley of Texas is reported. One of these wells on the farm of the State agricultural experimental station near Pecos was recently equipped with a No. 4 centrifugal pump and a 10-hp. gasoline engine. It is planned to irrigate 80 acres of land from this well. The experiment has proved so successful that many other pumps are to be installed in that section.

Engineer L. C. Hill of the United States Reclamation Service has made a report to the board of governors of the Water Users' Association of the Salt River valley of Arizona, that the preliminary work toward the erection of a great hydroelectric plant near Tempe, Ariz., is making satisfactory progress. The farmers have agreed to advance \$900,000 within the next two years toward carrying out the plans for installing this plant.

Eduardo Soto and Miguel Taboada of Pachuca, Mexico, have applied to the federal government for a concession to install a large hydroelectric plant on the Laguna de Zupitan, State of Hidalgo. Transmission lines will be constructed from the plant to the mining districts and industrial centers of that region.

The Yoquivo Development Company will install a hydroelectric plant at its mines near Yoquivo, State of Chihuahua, Mexico.

The city of San Augustine, Texas, will soon install a water works system.

The Silver Hill Mill & Elevator Company, Marfa, Presidio County, Texas, has been incorporated with a capital stock of \$250,000. The incorporators are R. K. Young, T. C. Crosson, H. B. Young and W. H. Colquitt.

The town of Maxwell, Texas, will soon establish a water works system.

The Enterprise Iron Works, Horrell Brothers, proprietors, 515 East Front street, Fort Worth, Texas, was damaged by fire October 19.

The gin and buildings belonging to the Colorado Oil Company, Dunn, Texas, were destroyed by fire October 19. Loss estimated at \$10,000.

The Southwest

KANSAS CITY, Mo., October 31, 1910.

More than the usual proportion of business consists of repair work, indicating that mill or factory owners are more concerned at present with keeping the machinery that they have in good operating condition than with replacing or extending their equipment.

Steam specialties of all kinds are wanted in considerable quantities, and the dealers in standard apparatus of this character have recently made numerous shipments to interior points. Railroad agents who have been interviewed at various stations, where traffic ordinarily shows a fair average, state that there has been a decided increase within the past month in both the billing and receipt of detail apparatus, shop and factory supplies, &c., which is significant of growing activity among industries generally in this section.

It is proposed at Axtell, Kan., to build a municipal pumping plant.

An electric power plant is to be installed at Chase, Kan., by the Chase Hardware & Implement Company.

Machinery is to be provided at once for the municipal power plant at Carman, Okla.

Plans for a hydroelectric plant of 600 kw. or larger will be put in execution before long by the Alamogordo Water Power Company, Alamogordo, N. M.

The Commercial Mining Company, Senator, Ariz., is vigorously prosecuting development work which will result at some time during the coming winter in the purchase of additional machinery.

The plant of the Clarksville Light Company, Clarksville, Tex., which is now equipped with two General Electric generators of 150 kw., driven by Lane & Bodley engines, will be rebuilt and enlarged in capacity.

A bond issue for the construction of water works has been approved at Onaga, Kan., and the work will be proceeded with as soon as possible. Burns & McDonnell, Kansas City, are in charge of the plans.

The City Council of Stafford, Kan., is preparing to establish a municipal lighting system at a cost of \$25,000.

The King City Electric Light & Power Company, King City, Mo., is considering the erection of a concrete building, 20 x 40 ft., and the installation of a 60-hp., 2300-volt alternating current generator.

The Woodcock Mfg. Company, Vinita, Okla., expects to purchase a lathe, wood cut-off saw, rip saw and a boring machine. The company recently moved its plant to Vinita from Litchfield, Ill.

Farther Central West

OMAHA, NEB., October 31, 1910.

Public utilities, whether operated by municipalities or private corporations, including electric lighting and traction companies, still provide the most considerable purchasing power of any interest or group of interests in this territory. Plans are now on foot to bring quite a number of machinery building plants to the States of this section from other parts of the country, some of the more active commercial bodies having undertaken to secure for them special advantages in the way of free sites, bonuses, &c., and to gather information regarding the best sources of raw material, labor, &c.

The Bullock Public Service Company, Omaha, Neb., will probably install an electric generating plant at Magnolia, Iowa. The matter of a franchise there is now under discussion with the authorities.

A large garage, with repair shop and electric power plant, will be built in Silver Creek, Neb., by E. L. Ives and others, who are organizing a company for the purpose. All of the machinery required will be motor-driven.

The purchase of machinery for a municipal electric station may be taken up in the near future at Wymore, Neb., where the project is under consideration.

A motor-driven air compressor and other machinery will be installed shortly by the Highland Consolidated Mining Company in Highland Park, near Georgetown, Colo.

A noteworthy sale of apparatus for export is one of equipment for experimental work, including a Case crusher, which will be shipped to the Royal School of Mines, Greenwich, England, by the Denver Fire Clay Company, Denver, Colo.

The Frigid Mining Company, Boulder, Colo., is arranging for the installation of an air compressor and drills. Additional machinery for mining and handling tungsten ore is to be purchased as the property is opened up further.

Preliminary plans are reported to have been made for the large hydroelectric plant to be erected in the vicinity of Glenwood Springs, Colo., by the Central Colorado Power Company, whose headquarters are at 1210 Seventeenth street, Denver, Colo.

The municipal authorities at Norfolk, Neb., have engaged engineers to prepare plans and specifications complete for a power and lighting plant as well as to recommend improvements in the water system.

The Intermountain Bridge & Construction Company, Tecumseh, Neb., has taken the contract for a complete system of municipal water works, inclusive of the pumping machinery, to be installed at Milford, Neb. The purchase of equipment is now being considered by the authorities.

The Waterloo Malleable Iron Works, Waterloo, Iowa, has broken ground for the erection of a 100-ft. extension to its gray iron building, a 100-ft. extension to its malleable iron building and an 80-ft. extension to its machine shop. Considerable new machinery is being purchased for the machine shop, which is used for the manufacture of power and transmission.

P. M. Banks, city clerk, Webster City, Iowa, advises that the city is considering the installation of a new power station, but a definite location has not been decided upon.

The R. A. Sleeper Mfg. Company, Sheldon, Iowa, recently organized, has established a factory in that city for the manufacture of underground gas systems, stock tanks and oil tanks. In addition to the manufacture of these products the company will do all kinds of sheet metal work and will handle a complete line of gas fixtures and mantles.

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At a recent meeting of the stockholders of the Corn Belt Packing Company the directors were authorized to erect a plant for the third time to replace the structures destroyed by fire. The capital stock was increased to \$250,000.

North Pacific Coast

SEATTLE, WASH., October 28, 1910.

Some rather heavy purchases are now being made of equipment for mining and ore reduction plants located in the interior of Washington, Oregon and Idaho, partly in consequence of new or extended development and partly to replace machinery destroyed by the recent forest fires. In placing most of this business prompt delivery is an object and contracts for nearly all such material will be filled on the coast, directly by manufacturers located here or from stocks carried in the warehouses or sales agencies at Portland, Tacoma, Seattle and Spokane. The last named has become a distributing center of increasing importance for this class of trade as well as for the sawmill and wood-working industries.

An ore crushing plant will be installed next spring by the Matanuska Gold Mines, Ltd., on its property near the head of Cook Inlet, Alaska. The company has offices in Seward, Alaska and Seattle, Wash.

The water works system at Union, Ore., will be improved and it has also been decided to build a municipal power and lighting plant.

E. K. Erwin, secretary of the Southern Oregon Water & Power Company is reported to be in charge of plans for a hydroelectric plant of 7500 kw., to be built on Deep Creek not far from Lakeview, Ore.

The Clark Brothers Company of Belmont, N. Y., which maintains offices here in the White Building, with E. S. Mitchell as manager, has arranged to carry in stock at Seattle an extensive line of the sawmill machinery of its manufacture, including steel castings and other parts. The branch will be equipped to repair not only the company's own apparatus but also any standard machines of a similar nature.

Spoor & Buckhard are rebuilding the mill at Sisters, Ore., that was destroyed by fire. Thoroughly modern equipment will be provided.

Work preliminary to the construction of the first of the new plants to be built by the Inland Empire Paper Company whose headquarters are now at Spokane, Wash., will begin early in the coming month. W. A. Brazeau, formerly of Grand Rapids, Wis., is directing the enterprise.

Work will be started in the near future at Earlington, Wash., on the plant which the Pacific Wheel & Axle Company is to build. The offices of the company are now in the Empire Building, Seattle. J. D. Jones, Walla Walla, Wash., is the moving spirit in the enterprise.

The Holland-Cook Mfg. Company, Tem Hill, Wash., has secured the plant of the C. E. Little Company at Obop and will operate both factories under one management with an increased equipment of machinery. Wood columns, flooring, &c., are manufactured.

The Birch Creek Mining Company, Ltd., Idaho Falls, Idaho, is contemplating the installation of hoisting machinery and air compressors, but has not determined whether steam or electric power will be used.

North Texas

DALLAS, October 29, 1910.

Announcement is made of the purchase by J. R. Nutt of Cleveland, Ohio, and associates of the plant and franchises of the Fort Worth Light & Power Company and of the electrical property of the Fort Worth Gas Company. The purchases of the franchises and physical properties of these two companies has been ratified by the city officials and announcement is made that the new owners expected to spend between \$1,000,000 and \$1,500,000, in improving, enlarging and overhauling the plants. Among some of the improvements contemplated are the erection of a large three-story power house and the equipping of this new power house with machinery sufficient to furnish nearly all the needs of the city from an electrical standpoint. Most of the large sum to be expended in improvements will go into machinery.

The property owners of Fort Worth are now discussing the advisability of voting a bond issue of \$1,000,000, for the improvement of the water works system of that city. The city has outgrown the pumping capacity, while there is also a great shortage on mains. A large part of the issue

which it is proposed to vote will be used in the purchasing of new pumping machinery.

Considerable progress has been made on the new building which is to house the addition to the Cotton Belt railway shops at Tyler, Texas. The shops, including the part now being constructed and the old shops, will cover nearly 6 acres of land, and about 800 men will be given employment. In connection with the machine shops an up-to-date electric plant is to be installed. Two dynamos with a combined capacity of 700 hp. are to be installed. The power room in which they will be placed has space for another large one, which will be installed as needed.

The Texarkana Seating Company, with S. H. Richardson as manager, is the name of a new enterprise which expects to be ready to begin operations at Texarkana, Ark., about January 1. The incorporators of the company intend to invest \$200,000 in erecting and equipping their plant. Ground has already been broken for the building and the company will soon be on the market for suitable machinery.

At a recent election held at Georgetown, Texas, the proposition of voting bonds for \$45,000 for the purchase of the private water and light plant at that place carried. The privately owned electric and water plant is to be purchased by the city at a cost of \$3500 and the balance of the bond issue is to be used in purchasing new pumping machinery to increase the capacity of the plant.

The Northwest

ST. PAUL, MINN., October 31, 1910.

All through southern Minnesota and the Dakotas there are visible increasing preparations for the production or distribution of agricultural machinery and apparatus or implements of other kinds for farm use, including gasoline engines. Practically without exception local factories are arranging for an increased output to be marketed by dealers in the spring; and outside concerns have been letting contracts for the erection of new warehouses or estimating shops in the principal centers at which orders are taken. The demand for equipment used by manufacturers of such material is keeping up with the general expansion in the various lines affected.

A large new warehouse, with some tools for repairing and assembling agricultural machinery, will be erected at Dickinson, N. D., by the J. I. Case Threshing Machine Company.

The central power station at Belle Fourche, S. D., owned by the Belle Fourche Light, Heat & Power Company, recently burned and will need to be replaced.

The Minneapolis Northern Suburban Railway Company, recently incorporated for \$250,000 by John J. McCarthy, Paul J. Marion and others of Minneapolis, will start work in the spring on an electric traction line to Little Falls, Minn.

Quite a number of electric motors will be purchased during the winter and spring by different interests in the vicinity of Coleraine, Minn., as arrangements have been made by the Oliver Iron Mining Company to supply current to other companies there from its new power plant.

The installation of an electric light system has been decided upon at Gilbert, Minn., and funds for the purpose are now being provided.

An addition, 45 x 80 ft., is being made to the cutting plant of the Twin City Granite Works, St. Paul, Minn.

A steel tower and tank are needed at Worthington, Minn., for city service.

A sash and door factory is to be built at Aberdeen, S. D., by the Western Mfg. & Building Company.

A bond issue for the construction of water works was recently authorized at Leola, S. D.

Contracts have been awarded for a new warehouse, 77 x 122 ft., for the American Steel & Wire Company at Fargo, N. D., for which some mechanical and electrical equipment will probably be required.

It is reported from Lucile, Ida., that the United Placer Company may construct a hydro-electric plant of about 3600 kw. in that vicinity.

The Economy Specialty Company, Grand Forks, N. D., has been incorporated with \$20,000 capital stock to manufacture the Economy heat conserving and fuel saving stove and furnace pipes. The company's factory is located at 114 North Sixth street and is equipped with a complete line of pipe making machinery. The officers of the company are: H. G. Snell, president; C. G. Alguire, vice-president; H. J. Johnson, secretary and treasurer.

The Oxford Linen & Mattress Company, Winona, Minn., is having plans prepared by L. L. Summers & Co., 164 Dearborn street, Chicago, for a manufacturing plant comprising six or seven buildings of one, two, three and four stories. Plans are now in progress and the engineers will be ready for figures about November 25.

Preventable Blast Furnace Accidents

Methods of Guarding Against Explosions of "Normal" Gas and Blowing-In Gas—Slips and Breakouts

BY R. H. SWEETSER.*

Of the serious accidents peculiar to blast furnaces there are several that are preventable, and when they do occur they can be blamed almost wholly on improper blast furnace practice. It is the purpose of this article to discuss these avoidable accidents in detail, and if possible to point out the means of preventing the horrible disasters that have too long been considered a necessary evil of the blast furnace business. There are also accidents due to the faulty design and construction of the blast furnaces and their equipment; and often the furnace practice has to be compromised because of construction errors.

Besides the accidents peculiar to blast furnaces there are those liable to happen wherever boilers, machinery and railroad tracks are used. It is probable that many of the blast furnace fatalities of recent years have been due to the rapid progress in furnace construction and output. The designers and construction engineers in many cases have gone beyond the limits of actual experience, and have built big, unruly brutes of furnaces that have required more than ordinary skill of the furnace men who operated them. Thus the very magnitude of the blast furnace process has become a source of danger. But there has also been a disposition to consider that the furnace business is necessarily dangerous, and that certain accidents are unavoidable and must be expected. Improvements in blast furnace practice can change this impression of danger to a feeling of safety and thus help to remove the stigma that has given rise to such expressions as "the making of steel and the killing of men."

Furnace Gas Accidents

Some of the most disastrous accidents around blast furnaces are those due to gas explosions, and many lives have been lost and much property destroyed by their terrific force. These explosions take place in various parts of the plant—at the top of the furnace, in the dust catchers, in the gas mains, in the hot blast stoves; and it is regrettable that even in the past few years there have been explosions of gas in the cold blast mains and blowing engines. Besides these strictly gas explosions there are those "slips" that are so fearful in results and so uncertain at times as to cause. In addition to the explosive force of the gases from the top and from the hearth of the furnace there is also their deadliness when breathed by the men.

Normal Gas

The waste gas of a normal furnace is not a dangerously explosive mixture and is not even a very rich fuel gas, and its control is a comparatively easy matter. Yet when the furnace is stopped for a few minutes and the blast put on again, there *could* be an explosion of this normal gas providing that the gas accumulates where it is mixed with air and is then ignited. Such explosions can take place under the boilers, in the gas mains, and in partly cold hot blast stoves. Usually such explosions are not of much force, but are simply "puffs" that loosen the joints of the gas burners, or blow off the mud or clay used to seal the explosion and cleaning doors of the underground gas flues (for there are some underground gas mains still in use).

There is no excuse for an explosion of normal waste gas, and a careful stove tender or boiler fireman will prevent it by using ordinary care in lighting the gas in the stoves or under the boilers. If the walls of the combustion chambers are already hot the gas will ignite quietly as soon as the gas valve is opened. Otherwise, the gas should be lighted with a little burning wood or coal.

One source of explosions of normal gas is the practice of raising the bleeders whenever the blast is off the furnace to change a tuyere, or for any other such reason. The raising of the bleeder causes an upward draft through the downcomer and dustcatcher, and thus air is drawn into the gas mains and dustcatcher. When the blast goes on again there is danger of having the mixture of air and gas ignite and explode in the dustcatcher and gas main. There is no need to raise the bleeder during a short stop. If the gas from inside the furnace interferes with the men changing a tuyere or boshplate, the trouble can best be remedied by "drafting back" through the bustle pipe and hot blast main to a stove with its chimney valve open. This simple method prevents the gas from coming out on the men at work on the tuyere or plate. At some furnaces the bell is opened to draw the gas away from the tuyeres, but this is not good practice and often heats up the top rigging. A careless stove tender could cause a gas explosion in a "cold" stove by allowing too much gas to enter the stove before it ignites. In such a case there would be enough gas to do damage to the stoves and the inlet valve, as well as to burn the man who did the careless trick.

The analysis of a "normal" gas will vary greatly with the kind of iron being made, the physical condition of the stock filled into the furnace and with the extent of the economic working of the blast furnace practice in question. The amount by volume of CO_2 will be about 12.5 per cent.; of CO , from 20 to 26 per cent., and the ratio $\text{CO} \div \text{CO}_2$ should be less than 2.

Blowing-In Gas

The most dangerous gas from the blast furnace is that made during the first few hours of blowing in. During the first few minutes after lighting a furnace the waste gas is nothing but smoke from the burning wood. But this very quickly changes to a highly explosive gas containing much carbonic oxide, and considerable hydrogen and marsh gas, but with only a small percentage of carbonic dioxide. The waste gas is now dangerous if not properly handled, and a gas explosion is liable to wreck the dustcatcher, gas mains and the whole top of the furnace. This gas is also very deadly if breathed. In no case should the blast be interrupted after it is once turned on to a newly lighted furnace, until after the first cast of iron is out.

To prevent explosions of the blowing-in gas, all fire must be kept away from the gas burners at stoves and boilers until pressure of the gas forces it through every crack and crevice in the whole gas main system. When all air in the flue connections has been expelled and nothing but gas is inside, then the burner farthest from the furnace can be opened and the gas lighted. As the flow of gas increases, more burners under boilers and stoves can be lighted; but it is better to have too few burners on than to have one burner too many,

* Superintendent Columbus Iron & Steel Company, Columbus, Ohio.

because if air is drawn into the gas main or downcomer the gas will "kick back," and the explosion that follows may wreck the plant with fatal results.

In 1897 the writer made an investigation of the "Analysis of Blast Furnace Gas While Blowing In," and the results were published in the *Transactions of the American Institute of Mining Engineers* (p. 608, vol. XXXVIII). It was found that "during the second and third hours the waste gas is made up mostly of carbonic oxide, with considerable hydrogen and marsh gas. There is but little carbonic dioxide, and the ratio $\text{CO} \div \text{CO}_2$ is at its high. A sample taken within the first half hour had 6.66 per cent. of hydrogen, but there was no hydrogen in the sample taken during the third hour. About three hours after the blast went on the gas contained 2.8 per cent. CO_2 , 28.8 per cent. CO , 4.2 per cent. CH_4 , and the ratio $\text{CO} \div \text{CO}_2$ was 10.28.

The "Dougherty method" of preventing gas explosions has been used while blowing in, and explosions were completely avoided. This method has been described in *The Iron Age*.

Gas Explosions in the Cold Blast Pipe

It is to be regretted that even in recent years there have been some furnace gas explosions inside the cold blast mains and in the air cylinders of the blowing engines. It is only through bad practice and gross neglect that such an explosion takes place, even if the stove tender is careless and does not close up the stoves. Such an explosion is impossible except when all blowing engines are completely stopped, and at the same time the hot blast and the cold blast valves are open, so that the gas from the hearth of the furnace can work back through the tuyeres into the hot blast main and air "tubs." Usually such conditions exist after the furnace is stopped to change a leaking tuyere or bosh plate. If much water has leaked into the furnace water gas will be generated in the hearth, gather in the hot blast connections, and work back through the stove to the cold blast connections. When the engines are started again there is a mixture of air and water gas in all the connections between the furnace and the engine room, and it is said that the explosion that follows is the most terrific of all that happen around a furnace. The writer is glad that his experience does not include this class of explosion, but he saw a plant shortly after one had taken place. The wreck of the engines, stoves and blast mains was so complete that the furnace was out of blast for several weeks.

The only safe and sure way to prevent such a disaster is to make it a hard and fast rule that the blowing engines must never be completely stopped unless the blowpipes are all down. This means using a little extra steam when the blast is off, but it keeps the engine warmed up and it absolutely prevents gas explosions in the blast mains and engines.

Dangers from Slips

The danger from "slips" in the furnace are as numerous as are the reasons that have been advanced for them. A slip is a symptom of a deranged condition. Frequently the excessive slipping of a furnace has been stopped without removing the cause of the slipping, and in such cases the dodging of the cause has been at the price of increased cost. Although it has been generally conceded that Mesaba ores are more conducive to slips than any other ores, yet it is a fact that the use of 100 per cent. of Mesaba ores is not in itself sufficient cause for slips. Certain ores have had the reputation of being dangerous, but often it has been proved that when these ores are thoroughly mixed and properly used they are no more dangerous than the old range ores.

A very frequent cause of slipping is a small water leak in the cooling plates or tuyeres, especially when

the leak is too small to give easily detected signs. Other causes of slips are improper fluxing of the burden, ring scaffolds, scabs, a "dirty" furnace, poor coke, insufficient blast volume, interruptions in filling the furnace, large amounts of ice and snow going in with the stock, improper filling methods and other irregularities in the operation of the furnace or in its internal condition. As a rule the furnace will give some warning signs of a heavy slip, and the proper precautions should be taken to prevent exposure of the men to the falling stock thrown out at the top, or to the molten material and hot gases sometimes thrown out from the hearth. Complete absence of slips is not obtained even in the best behaved furnaces, and it is therefore necessary to provide some means of escape and shelter for the men whose duty it is to visit the top of the furnace when the blast is on.

In case it becomes necessary to check the blast on a furnace that is hanging, there should be an audible signal given, so that men around the furnace, as well as the men in the engine room, will know that the furnace is likely to make a heavy slip. The practice of slowing down the engines without giving the regular signals should not be tolerated, and if it is indulged in these are apt to be fatal results, especially at hand filled furnaces.

Breakouts

The accidents caused by the molten iron breaking through the hearth jackets are, perhaps, better prevented by proper construction than by the proper furnace practice. Yet it is absolutely necessary that even a properly constructed hearth should have careful attention in order to prevent breakouts of iron and cinder. Regularity in the times for casting and flushing should be firmly insisted upon, and the intervals between casts must be governed by construction, rate of driving and common sense. It is dangerous to hold back a cast of iron much beyond the regular time for casting.

Blowing Out

During the blowing out of a furnace there are some dangers from the enormous amount of gas, the volume of which gradually increases from the time that the filling of stock is stopped, and, of course, the temperature of this gas rapidly increases toward the danger line. But with the proper precautions the gas can be safely handled and its explosive qualities can be almost wholly overcome by the use of two or three 1-in. streams of water forced into the top of the furnace through the test rod holes. The water has the double effect of cooling down the gas, thus preventing heating of the top of the furnace and the downcomer, and it also makes such a large percentage volume of steam in the gas that explosions can be practically prevented.

When the last cast is out of the furnace and the blast is thrown off, the blowpipes should be taken down at once, and until the last blowpipe is down the blowing engines should be kept running slowly, and then they can be stopped. Unless the stock has been burned out to below the tuyeres (and only furnacemen of long experience should attempt to do this), each tuyere should be plugged up with clay as soon as the blast is off, in order to prevent the possible blowing out of any gas flames from the hearth, and also to stop further burning of coke as much as possible. The streams of water going into the top of the furnace will quickly cool down the remaining fire inside the furnace.

The Harbison-Walker Refractories Company, Pittsburgh, will make some large improvements and additions to its plant at Wyland, Ala., which will probably more than double the capacity of that plant in the manufacture of fire brick.

Safety Measures in Steel Works

Recent Results Secured by the United States Steel Corporation

In connection with the reading of the paper of William B. Dickson, first vice-president of the United States Steel Corporation, at the recent meeting of the American Iron and Steel Institute, as published elsewhere in this issue, literature was distributed among the foreign visitors showing the measures taken by the United States Steel Corporation to reduce accidents to a minimum. One pamphlet, which is known as Bulletin No. 1 of the United States Steel Corporation Committee of Safety gives an interesting account of the work of this committee. It gives some hitherto unpublished statements as to the large number of recommendations passed upon and the extensive ramifications of the committee's work in the plants of the subsidiary companies. After referring to the creation of the Committee of Safety and the gathering of data as to conditions at different plants and the measures taken to safeguard employees, the account says:

The committee put into operation immediately a system of inspection, selecting men familiar with the machinery and operations of the different subsidiary companies and sending them to inspect the mills and plants. These inspectors are also men of experience in matters connected with accidents, competent to detect sources of danger and able to devise means of avoidance. They report directly to the Safety Committee. Their reports are exhaustive, taking up each building in the plant and covering it in detail. They call attention even to the smallest sources of danger—worn floors, material piled carelessly and windows that should be cleaned to give better light. Their comments cover even loose planks that workmen have left where they might fall. Railings, ladders, footwalks and set screws are given the most careful scrutiny. The reports and recommendations are gone over with care by the Safety Committee and then are sent to the proper representatives of the company operating the plant in question. The committee requests the company to submit within 30 days a return showing what action has been taken to carry out the recommendations of the inspector; or, if objections are made to any recommendations, on what grounds. At the next meeting of the Safety Committee these returns are taken up and discussed in detail. Where objections have been made to any recommendations and the reason for such objections do not seem sufficient to the committee the representative of the company concerned is requested to appear and explain the matter. Whenever it seems necessary the committee, or one or more members delegated for that purpose, make a personal inspection of the plant with regard to any points in dispute.

NINETY-TWO PER CENT. OF SUGGESTIONS ACCEPTED.

In two years the committee has had 78 of the largest plants thoroughly inspected. It has received and considered no less than 5200 recommendations made by the inspectors. More than 92 per cent. of these recommendations were accepted and complied with by the companies interested. Less than 8 per cent. required any additional discussion.

In fulfillment of its further purpose as a clearing house for information of value in the prevention of accidents the committee, during this time, has received from the different subsidiary companies more than 75 suggestions of plans of new devices and appliances for safeguarding machinery, warning employees and otherwise preventing accidents. These suggestions often come in the form of letters stating the experience of the several subsidiary companies in connection with different kinds of accidents due to causes which might exist in other plants. These letters report various kinds of guards for machinery which have been found effective and are accompanied by blue prints, photographs, estimates of cost and all information necessary to all the companies where similar conditions exist, with recommendations from the committee regarding the different suggestions. By subsequent inspections the committee is enabled to tell how fully these different devices have been adopted.

STANDARDIZING SAFETY DEVICES.

The Safety Committee is now endeavoring to standardize those safety devices which are in use upon machinery common to a large number of the different plants. Heretofore each subsidiary company has worked out its own method of guarding flywheels, gears, electric switchboards and similar sources of danger which exist in all large mills. An endeavor is being made to determine, from among the different

methods in use to meet certain common sources of danger, which are the most effective and should be adopted by all mills and plants of the United States Steel Corporation and its subsidiary companies. It is hoped thus to insure the use of only the most improved and effective safeguards and, by familiarizing the superintendents and foremen with these safeguards, to bring about their ready adoption everywhere.

In the October Bulletin, from which the above is taken, the committee gives illustrations of the method of guarding the gears, flywheel, belt and pulley of a vertical punch; of guarding a belt and pulley of a drill press; of combining a blower and safety eye shield for an emery wheel; of guarding with a plate the pockets in a planer bed, and of guarding against a foot being caught between the floor and an elevator cage.

The Committee of Safety of the United States Steel Corporation and subsidiary companies consists of the following: Charles MacVeagh, chairman, general solicitor, United States Steel Corporation; C. L. Close, National Tube Company; F. B. Dodge, Tennessee Coal, Iron & Railroad Company; S. W. Tener, American Steel & Wire Company; E. H. Windom, Oliver Iron Mining Company; R. J. Young, Illinois Steel Company.

Needless Waste of Men

Fifty per cent. of the accidents in American industry are preventable, is the claim of the American Museum of Safety. In proof of this it has just opened a permanent exposition of safety devices in the Engineering Societies' Building, New York, to show how the dangerous parts of machines and processes may be protected, so as to save the lives and limbs of the workmen. It thus becomes a clearing house for every worthy device and every worthy thought concerning safety. It is its purpose to place this new museum idea on the highest plane, namely the realization of the greatest ideal regarding conservation—the conservation of human life.

The exposition consists of machines in actual operation, models and photographs of safety devices for circular saws and planers; presses and grinding machines; safety exit doors and fire escapes; respirators and helmets for supplying pure air; elevators, safety lamps, and containers for gasoline and other volatile liquids. Textiles, the building trades, transportation, quarrying, the chemical industries and woodworking contain their appropriate safeguards.

"I'm in trouble," said a pale and worried employer who called at the museum. "I've just lost one of my best workmen, through an accident on our circular saw. The wood kicked, throwing him forward on the saw, which cut him so badly that he lived only a few minutes. What can you show me in the way of a safety device?" Such problems as this arise every day in industrial life and clearly prove the necessity and value of a clearing house of practical information, where employers and workmen alike may go for advice and practical help.

The United States Sherardizing Company, New Castle, Pa., controlling the sherardizing patents for this country, issues a periodical named the *Sherardizing Magazine*, the latest issue of which contains the report made on sherardizing by Prof. Charles F. Burgess of the University of Wisconsin. He gives an exhaustive series of tests made of metal subjected to the sherardizing process.

The Williams Tool Company, Erie, Pa., is operating to full capacity. It manufactures pipe cutting and threading machinery in five standard sizes for pipe from 1/4 to 12 in.; also the Riblet transverse current heater for utilizing heat from gas engine exhaust, made in sizes for water heaters ranging from 50 to 1000 hp.

High Speed Tool Steel

Methods of Manufacture and Heat Treatment

BY WM. VANC. BRANDT.

The making of high speed or self-hardening tool steel differs in many respects from the making of ordinary steel. An important difference is that in making ordinary open hearth steel, for example, the charge is placed in the open hearth furnace in direct contact with the gases and flame, whereas in making tool steel the charge has no contact with the gases. In making tool steel the charge, consisting of carefully selected scrap, mostly old tools, with the addition of enough low carbon scrap to keep the carbon down within the specified limits, is placed in a small crucible. In the making of one well-known brand a black powder containing about 98 per cent. tungsten is then added, so much of this powder being added to each pound of scrap. The chrome is then added in a ferroalloy state and the crucible tightly closed and placed in a pit or furnace. The furnaces may be made to hold as many pots as desired; a four-pot furnace is not uncommon. Hard coal is then packed around these crucibles and hot air blown through the coal, producing gas. The gas passes up and around the crucibles, until the charge is thoroughly melted. If vanadium is to be added it is put in at this point and the metal allowed to boil for about 10 min. longer.

While the metal is boiling down the molds are put in shape to receive the charge. As they will naturally be colder than the molten metal they must be thoroughly heated in order that the metal may not become chilled, which would result in a bad ingot. As a further precaution the molds are covered on the inside with lamplblack, an ordinary lamp being used for this purpose. Lamplblack or soot acts also as a nonconductor and keeps the metal from coming in direct contact with the inner surface of the mold. The molds used are made in section and may easily be knocked apart, leaving the clear ingot. They vary in capacity, a common size being $3\frac{1}{4}$ -in. section, with height of 10 in.

When all is ready the molds are set in place, the crucibles lifted out of the furnace and the metal poured in the mold. As soon as the ingot is sufficiently cooled the mold is knocked apart and the ingot covered with coke dust and allowed to cool gradually. This takes from three to four hours. After the ingots are cooled they are placed in an annealing furnace and annealed at about 900 degrees C., this being followed by cooling in the air. They are then forged down into bars and the bars again annealed at a higher temperature, about 1100 degrees C. After another cooling in air the steel is ready to be forged into various tools.

Great pains must be taken in forging the tool, for it is here that a great many errors creep in which result in defective steel. The tool should be forged at a good white heat and care must be taken not to upset the bar. After the forging the piece should be heated to a very high heat. It has been found that the best results are obtained when the temperature is within a few degrees of the melting point, or until the nose of the tool is almost ready to run. Various methods of cooling are employed, as, for example, the use of an air blast or quenching in oil.

After this treatment the tool is ready to be ground and great care is necessary here as in the other processes. The tool should not be ground too fast. If a dry emery is used it should be run slowly and the tool should not be forced too hard against it. It is better to use a wet emery or the ordinary grindstone. By forcing the tool too hard and grinding it too fast small hair lines appear in the structure, which later

result in fracture. After grinding the tool is ready for use.

A few years ago, as is well known, most of the tool steel used in this country was made abroad, but of late years many of our own concerns have put this steel on the market, and as just as good results have been obtained from the domestic product, it has gradually come into use throughout the country. This steel is very expensive to manufacture and retails on the market at from 40 to 80 cents per pound. Nearly all high speed tool steels have practically the same constituents. The carbon is kept low, generally running from 0.55 to 0.65 per cent. The tungsten runs about 0.18 per cent., with chrome about 3.50 per cent. and vanadium about 0.20 per cent., when used, with phosphorus below 0.02, sulphur below 0.02 and manganese about 0.30. There is very little difference between the different brands of high speed steel.

Engineers to Visit Aliquippa

The Engineers Society of Western Pennsylvania has arranged an excursion to the new works of the Jones & Laughlin Steel Company at Aliquippa, Pa., on Saturday, November 5. A train will leave Pittsburgh on the Pittsburgh & Lake Erie Railroad at 1:30 p. m. and will leave Aliquippa about 5:30 p. m. The points of interest which will be visited are as follows:

The pump house has an ultimate capacity of 96,000,000 gal. per day; the installation includes four 12,000,000 gal. centrifugal pumps driven by 650-hp. vertical motors, operating on 6600 volt current. The billet and sheet bar mill comprises four 21-in. and six 18-in. mills. The blooming mill is a 40-in. train and is driven direct by a 20,000-hp. Mackintosh, Hemphill & Co. twin tandem compound condensing engine. This mill is in process of building and will not be completed for some months.

The open hearth department equipment includes four 250-ton Talbot tilting furnaces and one 400-ton mixer. There are four blast furnaces of 500 tons daily capacity each, all of which are completed and three are in operation. The blowing engine installation includes 10 vertical cross compound condensing engines. The power house installation includes four 1000 k. w. engine-driven generators, and there are also to be erected two 3000-kw. turbo-generators; in the power house are installed 52 400-hp. gas-fired vertical boilers.

The coal hoist on the Ohio River has a capacity for hoisting 800 to 900 tons of coal per hour. In the tin plate department, the equipment finished and in operation includes 12 28-in. hot mills, direct driven from one engine, six mills on each side; also five cold mills with rope drive and 24 tin pots. The wire and wire nail mill is equipped with electric drive throughout and contains 125 nail machines. The rod mill was built by the Morgan Construction Company, and includes 10 stands of the continuous type.

The parts of the new plant that are in operation are the tin plate mill and the rod mill, both of which have been running very successfully for some time. It will be several months until the open hearth plant is ready for operation, and in the meantime all the pig iron made by the three blast furnaces is sent to the South Side mills of the company in Pittsburgh.

The National Bolt & Nut Company, Pittsburgh, has awarded contracts for buildings, machinery, &c., for the manufacture of cold punched nuts. The equipment will consist of a 150-hp. Miller improved gas engine, Pawtucket nut presses, National nut tappers, machine shop tools, &c. This plant now has a capacity of 75,000 kegs of National hot pressed nuts annually, and the new improvement will make it the largest nut works in Pittsburgh.

Gases in Ordinary Steels

Amounts at Various Stages of the Process of Manufacture

In a recent number of *Metallurgie* is an article by Professor Goerens of Aachen on "The Gases in Ordinary Kinds of Steel." It presents much original work that is valuable. The historical part of the subject is first reviewed, then comes a short study of the various methods of extracting the gases. The method adopted by the author was to place the material in a vacuum and extract the gases at a high temperature. An ingenious and simple apparatus was worked out. The sample is obtained in the form of small chips from a planing or shaping machine, thereby offering the maximum surface and affording ready evolution of the gas. It is contained in a platinum crucible, that fills the under part of a vessel of fused transparent quartz, closed by a ground glass stopper and sealed with sealing wax. This is prevented from melting by a small water cooling arrangement. A small furnace furnished the heat. The apparatus and method of working are fully described in the original paper.

Most of the work was done on basic Bessemer material; but open hearth, electric furnace and crucible steels were also examined. The results are given in the tables below. The heat used varied from 850 to 1000 degrees C., the time of extraction from 12 to 60 minutes, and the weight of the sample from 7.67 to 32.66 g.:

and anthracite. No. 3 was taken from the top of an ingot, from the first heat, four minutes after casting. No. 8 was a similar sample to No. 3, but from the third heat, and was taken eight minutes after casting. Nos. 17 and 18 were from the upper and lower part, respectively, of a test ingot from the seventh heat.

The open hearth samples gave the results shown in Table 2. Nos. 22 and 23 were taken shortly before, and shortly after the addition of ferromanganese. No. 24 was taken while casting the first ingot of the same heat, and No. 25 while casting the last one. Nos. 26 and 29 were taken shortly before the addition of the various alloys; Nos. 27 and 30 shortly after, and Nos. 28 and 31 while casting the last ingots.

Nos. 19, 20 and 21 of Table 3 were taken from electric furnace material; No. 19 from the charge after the removal of the first slag; No. 20 after the removal of the second slag, and No. 21 from the finished steel. No. 32 was from a bad crucible steel; Nos. 33 and 34 from good crucible steel. Lastly, No. 35 was a rail steel sample, and No. 36 a Swedish pig iron. It may be seen that in the oxidized condition the amount of gas contained depends on the process, and is the smallest in the basic Bessemer. After the deoxidation with ferromanganese or other alloys, an increase in the amount of gas usually takes place.

G. B. W.

British Railroad Mileage.—The length of the running track of the railroads of Great Britain at the end of 1909, as given by the *Railway Age-Gazette*, was 39,622 miles, and the total length of sidings was 14,350 miles. At the end of 1908 the length of running

Table 1.—Basic Bessemer.

No.	Charge.	Analysis.					Volume of Gas cc.	Gas per 1 vol. metal.	Analysis.			
		C.	S.	P.	Mn.	Si.			CO ₂ .	CO.	H.	N.
1.....	1	0.050	0.057	0.074	0.23	0.019	4.74	0.88	20.1	42.1	24.2	13.6
2.....	1	0.067	0.038	0.079	0.40	0.021	9.52	3.38	7.75	76.3	6.0	9.95
3.....	1	0.067	0.038	0.079	0.40	0.021	4.94	3.01	4.9	74.9	6.5	13.7
4.....	2	0.056	0.066	0.103	0.28	0.014	4.51	1.95	13.8	45.1	31.8	9.3
5.....	2	0.083	0.050	0.103	0.49	0.050	11.56	4.10	14.7	65.1	12.2	8.0
6.....	3	0.039	0.062	0.070	0.25	0.008	2.51	1.44	9.7	51.8	25.5	13.0
7.....	3	0.072	0.049	0.072	0.39	0.007	4.03	3.30	8.8	69.9	11.0	10.3
8.....	3	0.072	0.049	0.072	0.39	0.007	2.04	1.20	0.3	75.9	11.1	12.7
9.....	4	0.075	0.051	0.085	0.37	0.015	3.34	1.50	6.5	76.6	11.3	5.6
10.....	4	0.302	0.037	0.112	0.89	0.021	6.85	3.90	1.5	77.2	4.5	16.8
11.....	5	0.043	0.074	0.086	0.28	0.013	1.55	0.59	9.5	64.1	15.9	10.5
12.....	5	0.190	0.065	0.106	0.43	0.017	10.98	4.40	4.3	79.7	3.5	12.5
13.....	6	0.056	0.066	0.103	0.28	0.014	2.61	2.10	24.8	46.5	17.4	11.3
14.....	6	0.083	0.050	0.09	0.49	0.050	2.64	2.70	5.8	73.4	7.8	13.0
15.....	7	0.036	0.064	0.068	0.29	0.010	1.40	1.20	9.9	68.2	20.1	1.8
16.....	7	0.056	0.053	0.077	0.47	0.016	2.67	2.10	1.1	...	22.2	...
17.....	7	0.056	0.053	0.077	0.47	0.016	4.79	3.60	10.4	68.5	9.2	11.9
18.....	7	0.056	0.053	0.077	0.47	0.016	3.68	2.50	9.6	65.1	12.0	13.3

Table 2.—Basic Open Hearth.

No.	Charge.	C.	S.	P.	Mn.	Si.	Volume of Gas cc.	Gas per 1 vol. metal.	CO ₂ .	CO.	H.	N.
22.....	1	0.093	0.054	0.025	0.30	0.003	3.66	1.7	2.2	85.6	7.4	4.8
23.....	1	0.138	0.037	0.031	0.93	0.35	4.49	1.9	3.4	82.8	8.1	5.7
24.....	1	0.138	0.037	0.040	0.93	0.35	1.92	1.6	3.8	74.9	13.9	7.4
25.....	1	0.142	0.039	0.045	0.93	0.236	1.09	0.85	1.7	68.4	15.4	14.5
26.....	2	0.108	0.039	0.018	0.39	0.003	3.30	1.7	5.0	78.5	7.4	9.1
27.....	2	0.114	0.033	0.023	0.60	0.003	3.17	1.8	2.6	83.2	4.7	9.5
28.....	2	0.112	0.031	0.024	0.58	0.001	6.98	3.3	4.2	81.7	10.2	3.9
29.....	3	0.140	0.052	0.045	0.49	0.006	3.15	1.7	5.4	79.4	6.3	8.9
30.....	3	0.175	0.041	0.045	0.77	0.007	3.44	1.7	4.5	79.8	5.6	10.1
31.....	3	0.137	0.042	0.049	0.65	0.011	3.96	2.3	3.5	78.6	6.7	11.0

Table 3.—Miscellaneous.

	C.	S.	P.	Mn.	Si.	W.							
19.....	0.058	0.043	0.085	0.12	0.017	...	2.43	1.3	7.5	80.1	7.1	5.3	
20.....	0.076	0.031	0.069	0.12	0.023	...	6.49	1.3	6.4	84.8	4.7	4.1	
21.....	0.150	0.042	0.098	0.22	0.160	...	3.80	1.9	4.7	78.3	11.7	5.8	
32.....	0.40	0.006	0.038	0.43	0.153	0.24	4.87	3.0	0.8	81.6	6.1	11.5	
33.....	0.40	0.006	0.038	0.43	0.153	0.24	2.25	1.9	1.3	69.2	18.6	10.9	
34.....	0.42	0.005	0.031	0.34	0.155	0.57	1.78	1.5	0.7	71.6	7.2	20.5	
35.....	...	...	...	...	...	...	14.30	6.1	3.7	72.7	8.3	15.3	
36.....	3.65	0.005	0.090	0.085	0.014	...	17.05	8.2	11.5	70.5	11.1	6.9	

The samples reported on in Table 1 were as follows: Nos. 1, 4, 6, 9, 11, 13 and 15 were taken from the blown metal before the ferromanganese addition. Nos. 2, 5, 7, 14 and 16 were taken after the addition of the alloy. No. 10 was from the same heat as No. 9, and was taken after the addition of both ferro and spiegel, the heat being of rail steel. No. 12 was from the same heat as No. 11, after the addition of ferro

track was 39,316 miles. At the end of 1909 the length of line in Great Britain (in equivalent of single track) operated solely by electricity was 204½ miles, and 229¾ miles was being operated partly by electricity. The corresponding lengths of line at the end of 1908 were 204½ and 200½ miles, respectively. The total quantity of electrical energy used in 1909 was 253,294,628 Board of Trade units.

Ontario Iron Mines in 1909

Five Properties, 263,777 Tons—Possibilities of Concentration

The nineteenth annual report of the Bureau of Mines for the Province of Ontario, Canada, deals with the mineral production in that province in 1909. The output of iron ore is put at 263,777 gross tons, valued at \$645,622. The pig iron production was 407,013 gross tons, valued at \$6,301,528. The value of all metallic minerals produced in 1909 was \$22,928,496. The iron ore was from five mines: Helen in the Michipicoten district, the Dominion Bessemer Ore Company's property near Loon Lake, east of Port Arthur, the Moose Mountain, the Atikokan and the Bessemer (formerly Mineral Range) in Mayo Township, Hastings County. The output of the first two, which was hematite, was 197,193 tons. The last three produced a total of 66,584 tons of magnetite.

The pig iron output was from seven blast furnaces—two each of the Algoma Steel Company at Sault Ste. Marie and the Hamilton Steel & Iron Company at Hamilton, and one each of the Canada Iron Corporation at Midland, the Standard Chemical Works at Deseronto (formerly Deseronto Iron Company) and the Atikokan Iron Company at Port Arthur. The seven blast furnaces named used 220,307 tons of Ontario ore 543,544 tons of foreign ore and 14,486 tons of scale and mill cinder. In the production of 407,013 tons of pig iron, 436,707 tons of coke was used and 973,413 bushels of charcoal. The operations at the various iron mines in Ontario as detailed in the report may be summarized as follows:

A Year's Operation

The Atikokan iron mine resumed work in August, 1909, and produced 150 tons a day during the time of operation. The work consisted of stoping on the wide ore body about 50 ft. from the mouth of the tunnel. A raise was put through west of the tunnel and the ore mined by a system of underhand stoping to the raise. The stope is carried about 40 ft. in width. To the east of the tunnel the ore body has been reached by an open cut. The ore is trammed out of the tunnel and dumped into a large gyratory crusher, then elevated to a bin above the railroad track and loaded direct into cars.

The Dominion Bessemer Ore Company, Ltd., opened up an iron ore deposit in 1909 about 22 miles east of Port Arthur, at the head of Thunder Bay. Two cargoes were shipped before the close of navigation. An ore loading dock has been built and a tramway from the dock to the mine about 1 mile inland. The ore lies in a bedded formation from 2 to 5 ft. thick. Two grades are produced, one running over 55 per cent. iron and the other below. Both are rather high in manganese, with very low sulphur and phosphorus.

The Moose Mountain mine shipped steadily during the latter part of 1909. The ore was taken out by underhand stoping from a vein about 65 ft. high. It was then crushed to an inch product and passed over magnetic cobbles to sort out the waste rock. A large plant has been put in for magnetic concentration. No ore is shipped in the winter months. Shipments are made over the Canadian Northern Railroad 80 miles to the docks at Key Inlet. The bins at the docks are so arranged that they well feed from the center of the bottom to a 42-in. traveling belt. This conveys the ore to a similar belt on the docks which elevates the ore to the dock trestle 60 ft. above the water level. The ore is weighed by an automatic device while on the belt. About 800 tons of ore can be loaded per hour and the pockets have a capacity of 8000 tons. The belts are driven by motors.

The Lake Superior Corporation shipped from the Helen mine about 1000 tons of ore per day in the season of navigation. No. 1 shaft is down to the sixth level, a depth of 450 ft. On the fifth level a body of iron pyrites was encountered and a considerable tonnage has been blocked out. Both iron ore and iron pyrites are now being shipped. Electric power for the surface plant is obtained from the Algoma Power Company at High Falls, on the Michipicoten River. A new 12-drill compressor driven by a 200-hp. motor has been installed, together with an 80-hp. motor to drive the crusher, an 80-hp. motor to drive No. 1 hoist and a 150-hp. motor to drive No. 2 hoist. A new turbine pump driven

by a 100-hp. motor with a capacity of 500 gal. per minute against a 400-ft. head has been installed on the fifth level. The company has been developing the Magpie mine, 15 miles northeast of the Helen, and railroad connection has been made with the Magpie. [The first shipment was made last week.—Ed.] Other work is being done by the company at Iron Lake, south of White River, and at Goudreau Lake.

Concentrating Ontario Magnetites.

The report contains the result of an investigation by George C. Mackenzie into the concentration of low grade magnetites. The writer says that while Ontario is comparatively poor in deposits of merchantable iron ore, it is rich in deposits of low grade material. Detailed figures are given of the cost of concentrating Ontario magnetites and converting them into briquettes. Mr. Mackenzie says that it has been demonstrated that first-class Bessemer concentrates can be produced from the crude ores tested, the concentrates forming hard porous briquettes more or less peroxidized and free from sulphur when submitted to a process similar to the Gröndal system of briquetting. On the question of cost, the report says:

Reliable data pertaining to costs of crushing are difficult to obtain, and when obtained are uncertain in application to specific problems. For the reason that different ores are of widely different physical structure, it has been stated that crushing costs may be estimated at the rate of 1 cent per mesh—20 cents per ton for 20-mesh, 60 cents for 60-mesh and \$1 per ton for 100-mesh. The writer has had no experience in the application of this schedule, but in so far as he can learn it tallies approximately with the costs of crushing ores of average hardness.

That the process of magnetic separation applied to the concentration of low grade Ontario iron ores is worthy of serious consideration cannot be doubted, and it is not too much to say that the outlook for the establishment of such an industry in Ontario is encouraging. Our blast furnaces are forced to operate with high priced fuel imported from the United States, and, in the majority of instances, are burdened with an ore mixture that yields not more than 35 per cent. of pig iron. Over 70 per cent. of the iron ore smelted in Ontario furnaces is imported from the United States, due to the fact that native mines cannot supply the demand for either foundry or Bessemer ores; indeed, at the time of writing there is but one Ontario mine producing Bessemer iron ore and in limited quantity.

That the production of high grade briquetted or nodulized Bessemer concentrates would find a ready market there can be no doubt, and if a price of \$5 to \$6 per gross ton for this material could be secured and maintained there should be a comfortable margin of profit above the costs of production and transportation.

Crerar, Adams & Co.'s New Quarters

Crerar, Adams & Co., Chicago, metals and railroad supplies, have removed to their new building, recently completed, at 239 to 259 East Erie street, at the corner of Fairbanks court. They had been established since 1858 at Fifth avenue and South Water street, Chicago, with the exception of one year following the Chicago fire.

The new building is 100 x 130 ft., seven stories and basement. It is of steel construction, absolutely fire-proof, with brick exterior and tile floors and partitions, the floors having a concrete surface. Every convenience has been installed to facilitate the transaction of business. There are two large electric elevators, and a pneumatic tube system connects all departments. The general office, on the first floor, is arranged in the style of a bank. It is lighted by the indirect system. The dictagraph, an improvement on the telephone, has been adopted for intercommunication in the office and connecting with the various floors.

The National Enameling & Mfg. Company, Youngstown, Ohio, has been incorporated by William Wilkoff and others with a capital of \$25,000. The company has leased the plant of the Youngstown Car Mfg. Company and will make enameled steel conduits. Other specialties will be taken up later.

Hydraulic Pressed Steel Company's New Machine Shop

The question of securing the proper amount of light and ventilation in factory buildings is vital because a well lighted and well ventilated shop means better satisfied workmen and more work per man. Considerable attention was paid to providing adequate light and ventilation in the erection of a new machine shop recently completed by the Hydraulic Pressed Steel Company, Cleveland, Ohio, which was designed by the Forest City Engineering Company of that city. Another important feature in the construction of this building is the small number of columns and the economizing of space in locating them and the shafting. The accompanying engraving gives an interior view of the shop before the installation of the machinery was completed.

This building is 85 x 250 ft., and runs east and west. There are three continuous metal skylights with wire glass extending the whole length of the building, which let in light from the north only, thus excluding the

A. Russell of St. Paul. The patent covers a form of joint, the end of one rail being provided with a slot or mortise and the end of the other rail with a tenon projecting into the mortise. In this way, it is claimed, labor will be saved in laying rails and angle bars and bolts can be dispensed with.

The Volatile Matter of Coal

The title of the first bulletin issued by the new Federal Bureau of Mines is "The Volatile Matter of Coal." The authors, Horace C. Porter and F. K. Ovitz, conducted their investigations at the Pittsburgh station while it was under the Technologic Branch of the Geological Survey. The results obtained at that plant showed that the work of determining the fuel values of the coals and lignites in the United States would be incomplete if it did not include systematic physical and chemical researches into the processes of combustion. Hence, in their later investigations the



Interior View Showing the Excellent Lighting in the New Machine Shop of the Hydraulic Pressed Steel Company, Cleveland, Ohio.

direct sunlight. This is an adaptation of saw-tooth construction to a building running east and west. Ventilation is obtained in the middle and higher bay by monitor windows operated from the ground.

In the center bay a 10-ton crane with 36-ft. span runs the length of the building. At the west end a railroad track passes through the building, enabling the crane to pick up heavy plates and other material from flat cars. There are only 10 columns in the entire building. These are spaced 43 ft. on centers, and the crane runway, as well as the roof trusses, are carried this distance between the columns on deep girders.

The main line shaft is also carried from the bottom chord of these girders, being fastened to sleepers which are hook bolted to angles. This construction is made possible by running the shafts through slots in the columns, thus placing them where they are out of the way of other equipment. A new feature is provided in the construction of the large railroad doors. These are hung on an overhead track similar to ordinary sliding doors, but they are opened and closed in a few seconds by a rack and pinion arrangement.

The Russell-Sklenar Steel Rail Company states that it is planning to establish, possibly at Duluth, Minn., the manufacture of a steel rail patented by Charles

authors carried on such researches, concentrating attention on those lines of inquiry which promised results of greatest economic importance. This bulletin is, therefore, a report on an investigation of the volatile matter in several typical coals—its composition and amount at different temperatures of volatilization. Quoted directly the authors say:

The investigation has already shown that the volatile content of different coals differs greatly in character. The volatile matter of the younger coals found in the West includes a large proportion of carbon dioxide, carbon monoxide and water, and a correspondingly small proportion of hydrocarbons and tarry vapors. The older bituminous coals of the Appalachian region yield volatile matter containing large amounts of tarry vapors and hydrocarbons, difficult to burn completely without considerable excess of air and a high temperature. Coal of the Western type, moreover, gives up its volatile matter more easily at moderate and low temperatures than that of the other type. The volatile matter produced at medium and low temperatures is rich in higher hydrocarbons of the methane type, such as ethane and propane, which contain a larger portion of carbon than is present in methane.

These facts help to explain the difficulty of burning Pittsburgh coal, for example, without smoke, the low efficiency usually obtained in burning high volatile Western coals, the advantage of a preheated auxiliary air supply introduced over a fuel bed, and the advantage of a furnace and boiler setting adapted to the type of fuel used. They bear directly also on the question of steaming "capacity" of coal for locomotives, the designing and operation of gas

products for high volatile fuels, and the operation of coke ovens and gas retorts.

The results show further that certain bituminous coals of the Interior and Rocky Mountain States give promise of good yields of by-products of coking, notably ammonia and high grade power gas, comparing favorably in these respects with the high grade coking coals of the Eastern States.

They show also that inert, noncombustible material is present in the volatile products of different kinds of coal to an extent ranging from 1 to 15 per cent. of the coal.

The Allen Safety Set Screw

A safety set screw made from a solid bar of steel and guaranteed not to mushroom or upset in the hole has been recently placed on the market by the Allen Mfg. Company, Hartford, Conn. These screws are made in a number of different sizes ranging from $\frac{3}{8}$ to 1 in. long and with a variety of points such as

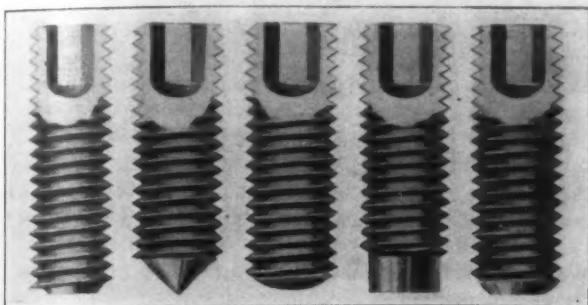


Fig. 1.—A Group of Set Screws Made by the Allen Mfg. Company, Hartford, Conn.

cup, conical, oval, dog and flat which are shown in Fig. 1. A hexagonal hole formed in the other end serves as a hold for the wrench which can be made by bending a piece of hexagonal steel of the proper size at right angles as illustrated in Fig. 2.

The principal advantages of these screws are that all styles of points are available, and it is not necessary to retap holes in order to fit the standard thread. Great strength is another advantage claimed for these screws; it is said to be practically impossible to break

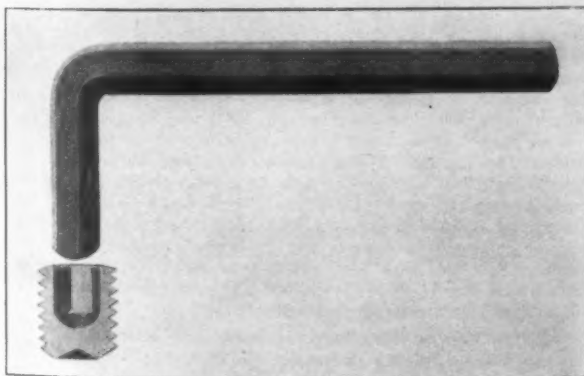


Fig. 2.—Hexagonal Steel Wrench Used with the Allen Safety Set Screw.

or injure the screw. The largest size of screw, which is $\frac{3}{4}$ in. in diameter by 1 in. long, under test has withstood a pressure estimated at 5 tons without breaking the screw or stretching the thread. The points of these screws are heavily reinforced so as to resist any crushing tendency under heavy strains and the screw mentioned above has $\frac{3}{8}$ in. of steel between the bottom of the hexagonal hole and the point.

Factory inspection laws and insurance requirements make it necessary to cover up protruding set screws on shafting and revolving parts of machinery. With the Allen screws no covering is necessary as the screw is entirely contained within the hole in which it fits, and there are no projections to catch on clothing and cause accidents. It is unnecessary with this screw to have a hole in the collar for half of its depth to admit a

wrench. All that need be done is to drill a hole through the collar and insert the screw, tightening it with the L-shaped wrench.

The Kentucky and Indiana bridge over the Ohio River at Louisville, Ky., is to be rebuilt for heavier loads and greater traffic capacity. The new structure is designed for Cooper's E-65 loading, and the two long spans over the Kentucky and Indiana channels will be 620 ft. long. The bridge will be a double track structure, with roadways outside of the trusses, and will be supported on new concrete piers. The old bridge was built in 1881-86 and was made up of through truss spans, with a single track and roadways. The live load which the old structure was designed to carry consisted of two 57-ton locomotives, followed by a train load of 2240 lb. per foot, with 1200 lb. per square foot for the roadways.

The Austro-American Magnesite Company, which is owned and operated by the American Refractories Company of Chicago and Joliet, Ill., is pushing rapidly to completion additions to its plant in Austria that will double its present capacity. By January 1, 1911, it is anticipated the output of dead burned magnesite from this plant will range from 60,000 to 75,000 tons annually. Large shipments will immediately be made to the United States to enable the American Refractories Company to maintain stocks at Philadelphia and New Orleans, something it has not heretofore been able to do owing to the heavy demand for its product.

The engineers of the Interior Department are preparing estimates for an appropriation that will be asked from Congress this winter for an interesting highway bridge across the Little Colorado River in Arizona. This bridge will have an arched span of 650 ft., and will have to be erected without false work. It will be similar in design to a bridge across the Zambesi River at Victoria Falls, South Africa. It will span the Little Colorado below Canyon Diablo, the highway for which it is planned running from Flagstaff to Tuba.

The Canton Iron & Steel Works, Baltimore, Md., has been chartered under the laws of Maryland, with a capital of \$100,000, and will operate the plant of the former Canton Iron & Steel Company, recently purchased at receivers' sale. John J. Caine is president; H. E. Woodman, vice-president; Wm. Sourbeer, secretary and treasurer, and John C. Brown, general manager. The plant was put in operation October 12 and is now running at practically full capacity, making refined iron bars, muck and scrap bars and socket and staybolt iron.

The Factory Sites Improvement Company, Portland, Ore., has been incorporated with \$150,000 capital stock. The company has made purchases of approximately 800 acres of land, having 6750 ft. of frontage on the Columbia River, lying within the 5-mile circle from the business center of Portland and adjoining the extensive holdings of the Swift Packing Company. The land is advantageously situated in relation to the main routes of transportation between the Columbia River and the city.

The Association of Edison Purchasing Agents has elected officers for 1910-1911 as follows: H. C. Lucas, Philadelphia, president; W. H. Francis, Boston, first vice-president; J. W. Brennan, Detroit, second vice-president; A. W. Banks, Jr., Baltimore, treasurer; J. J. Miley, Minneapolis, stock controller; H. F. Frosse, Edison Electric Illuminating Company, Brooklyn, N. Y., secretary.

The Betterment of Labor Conditions in the Steel Industry*

Accident Prevention, Relief and Pension Funds, and the Reduction of Sunday Labor

BY WILLIAM B. DICKSON.†

No man who has had experience in the employment of large numbers of workmen, and, least of all, iron and steel manufacturers, will be inclined to minimize the importance of maintaining such conditions of employment as will serve to keep the workmen contented with their lot. When you take into account the small value of the raw material in the ground required to produce a ton of finished steel—i. e., the ore, coal and limestone, and compare this comparatively insignificant amount with the final total cost of production, you will realize the fact that the great difference is made up of the amounts paid for labor in the various processes from the mine to the consumer. The annual report of the United States Steel Corporation for 1909 shows this in a striking manner in the item of annual salaries and wages amounting to \$151,663,394.

While it is true that the importance of the attitude of the wage earner toward his employer has always been recognized, it is only in recent years that the subject has been seriously viewed from any standpoint other than the wage rates, and that there has come a recognition on the part of the employer of what has been called a "social responsibility."

The Human Element Receiving More Attention

Much weight has been given, and properly, to the vast resources of ore, coal and stone which form the basis of our industry, and to the necessity for proper conservation of these materials. We are now beginning to place more emphasis than formerly on the human element, which, purely from the economic standpoint and aside from any altruistic motives, must be kept in condition for efficient work if we are to maintain our position in the world markets. Dr. Eliot of Harvard, says: "Progress is measured by happiness, not by dollars and cents." And no nation can be really progressive unless the great body of its citizen workers are happy and contented.

As an old Carnegie man, you will pardon me if I cite as one of the first notably successful recognitions of the human element as a large factor in successful mill operation, the action of Mr. Carnegie, who made it possible for his mill superintendents and other practical operating men who had risen from the ranks of ordinary workmen to become his partners. He is credited with having made the statement that if he had lost all of his other assets, but had retained his splendid working organization, he could have speedily regained a dominant position in the steel industry. While due allowance must be made for some amiable exaggeration in this declaration, few men who have had any practical experience in the administration of large enterprises will be apt to minimize the importance of the attitude of the workmen to the employer. How best to weld his employees into a compact and efficient working force is a question constantly in the mind of every intelligent employer.

Steel Corporation Methods for the Prevention of Accidents

The most striking instance of the aroused interest in the welfare of the workmen is shown in the effort and money which are being expended to safeguard the

lives and health of the workmen. I can best illustrate this by a statement of what is being done by the subsidiary companies of the United States Steel Corporation.

These companies now employ about 50 men, who devote all or a substantial part of their time to questions affecting the safety and health of employees. The officials in charge of this work estimate that a total expenditure of about \$400,000 per year is now and will continue to be required for the maintenance of this organization and for providing safeguards and all sorts of safety devices. These range all the way from the protection of a set screw on a shaft to the building of subways under tracks for use of workmen. For a statement in greater detail of methods and appliances for the prevention of accidents, you are referred to an article recently published in the *Survey* by David S. Beyer, chief safety inspector of the American Steel & Wire Company, from which I quote as follows:

This work is a logical outgrowth of association with the accidents which must inevitably accompany the use of machinery. It is probably safe to say that the casualty or accident department has always preceded the safety department; that dealing with the men who have been injured has brought about a desire to prevent the recurrence of accidents. From the first scattering efforts in this direction have grown more systematic methods, until accident prevention has developed such a variety of detail and such breadth of possibilities that it is fast becoming a technical branch of itself.

What was originally a species of self-defense has broadened out into more humanitarian lines, until at present it is being taken up on a scale that would not have been dreamed of in this country a few years ago. Safeguards once considered entirely satisfactory are being replaced by others of improved construction. New forms of protection are constantly being devised. In some of the companies which were brought together in 1901 to form the United States Steel Corporation organized safety departments have existed for the last fifteen years; in all of them more and more attention has been given to safeguarding employees, until at present each of the main subsidiary companies has a corps of trained specialists who devote their time to studying the causes of accidents and to devising means to prevent them. New impetus was given this work by the interest manifested in it, and the policy adopted toward it by the officials of the Steel Corporation.

Every year all the men in charge of these matters for the several subsidiary companies have been called together at the general offices in New York for discussion of the problems connected with their work, the first general meeting being held in May, 1906. At these meetings the officers of the corporation have given assurances of support to the subsidiary companies in every practical undertaking for the prevention of accidents. This resulted in the formation in April, 1908, of a Central Committee of Safety. This committee is composed of five members representing subsidiary companies operating the largest plants and mills, with an officer of the United States Steel Corporation acting in an advisory capacity. It was empowered to appoint inspectors to examine the various plants and equipment, and submit reports of safety conditions, with suggestions for improvement. The committee was further requested to record and disseminate data on regulations, rules, devices, &c., tending toward safer working conditions in the plants.

The committee has selected as its inspectors men already engaged in safety work in the subsidiary companies; in other words, the matter has resolved itself largely into a system of intercompany inspection, which gives the plants inspected the benefit of new viewpoint and varied experience, and at the same time enables the inspectors themselves to see what is being done elsewhere, and to carry back new ideas and devices to their own plants. The plan has worked well and has been of great assistance to the several com-

* A paper read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

† First vice-president United States Steel Corporation.

panies, who hitherto have been coping with their own safety problems without definite knowledge of what other members of the great corporation family were doing.

Meetings of the committees are held about once a month, when arrangements for inspection are made and reports considered. Drawings, photographs, rules, specifications, &c., are submitted for consideration, and such as seem desirable are sent out to all companies.

Tennessee Company Welfare Work

Mr. Crawford, president of the Tennessee Coal, Iron & Railroad Company, has devoted much thought to safety and welfare work among his employees. He writes about an interesting development as follows:

One of the most important conveniences for the men is bath-houses, which have been installed at the ore mines. There are at present four in use and two are being constructed. They are centrally located at the different divisions on Red Mountain, are built of brick with concrete floors, separate lockers, and wash-rooms for whites and blacks. They are equipped with shower baths and wash-troughs and hot and cold water. They are heated by exhaust steam and are kept clean by attendants in charge night and day. A charge of 50 cents per month is made for the use of locker and baths. This makes it possible for the men to change their clothes before entering the mine, and on rainy days when they would get wet coming to work they are able to enter the mine and go to work in dry garments.

Previous to the installation of these "drys" many men failed to come to work on rainy days. This has not only been a comfort to them, but their health and efficiency have been greatly improved.

Where the question of patent rights is involved, our companies are properly jealous of any attempt on the part of our competitors to infringe, but in this movement to safeguard the lives and health of our workmen, we will be glad to give every one interested the benefit of our experience, and to aid in every possible way to attack this problem of accidents to workmen at the proper end—i. e., by preventing them. I am authorized by Judge Gary to invite your inspection of our methods and appliances. I have for distribution a limited supply of booklets which have been issued by the various companies, and Mr. MacVeagh, the general counsel of the corporation, and Mr. Bolling, his assistant, who supervise this work, will, I am sure, be glad to answer any questions, either verbally or by correspondence.

In connection with this subject it is interesting to note in the daily papers a statement to the effect that the sum of \$50,000,000 will be expended by American railroads in installing safety appliances on railroad equipment under the rules recently adopted by the Inter-State Commerce Commission.

Accident Relief

In spite of every precaution, large numbers of accidents occur, involving temporary or permanent disability or death. To meet this condition and secure some measure of uniformity in all the different departments, there has been devised a voluntary accident relief plan. This plan of relief is a purely voluntary provision made by the companies for the benefit of employees injured and the families of those killed in the service and constitutes no contract and confers no right of action. The entire amount of money required to carry out the plan will be provided by the company, with no contributions whatsoever from the employees. The plan provides different compensation for temporary and permanent disablement, based on the nature of the injury, length of service, and number and age of dependents. The present plan is tentative only, but if it meets with success it is hoped that some similar plan will be permanently adopted.

This question of workmen's compensation is receiving much attention, particularly in those States where large mining and manufacturing industries are located, and the party conventions are bringing it to the front as a political issue by inserting in their platforms planks demanding compulsory compensation laws. New York and Ohio within the past year have passed employers' liability laws, and in the States

of Wisconsin, Massachusetts, Minnesota and New Jersey commissions have recently been appointed by the Legislatures to consider the subject of compensation for industrial injuries.

The Law's Delay

Under existing liability laws in the various States, only a small proportion of the workmen injured by accidents of their employment receive anything approaching adequate compensation. The fact that some employers do voluntarily pay their injured workmen even where no legal liability exists, only emphasizes the present chaotic conditions. These conditions are bad enough, even if the questions arising under them were quickly adjusted, but the trouble is intensified and ill-feeling engendered between workmen and employers by what is, in my judgment, the great shame of the American people—namely, "the law's delay." In the majority of cases, the very essence of justice is the promptness with which it is administered, but by delays on technicalities, by retrials and appeals to higher courts, the man of limited means is placed at an immense disadvantage. To our shame we must admit that under such conditions the poor man and the rich man or corporation are not "equal before the law."

I was interested in noticing the language of the oath of office which Mr. Hughes has just taken on his accession to the Supreme Bench. One clause reads: "I will . . . do equal rights to the poor and to the rich." I believe that our independent legislative and judicial systems are the very bulwarks of our free institutions and I have no sympathy whatever with the recent wanton attacks on our courts. I would be the last to question the good faith and honesty of purpose of our judges. Nevertheless, the fact remains that judicial procedure in this country must be simplified before such a statement as is contained in this oath becomes a reality in practice.

President Taft has touched on no question more vital to our prosperity than this one of "the law's delay." We need an American Dickens to show forth in their true colors the workings of our circumlocution offices. The practical certainty of long-drawn-out litigation and the remote prospect of a favorable verdict in many cases, owing to the operation of what many believe to be antiquated "fellow servant," "contributory negligence," and "assumption of risk" clauses in the various statutes have helped to foster another evil—namely, the so-called "ambulance chaser" who preys upon the credulity of the injured person and undertakes the prosecution of his suit for a contingent fee, often amounting to 50 per cent. of the award. Other expenses usually reduce the net amount received to about 30 per cent.

There are great difficulties in the way of framing laws to meet these conditions. The statement has been made that "legislation is the final agency by which the law is brought into harmony with social needs." In other words, legislation, to be effective, must be the crystallization of public opinion. But even if laws are enacted which reflect public opinion and meet the approval of a majority of employers and workmen, they must run the gauntlet of the courts on the question of their constitutionality. In the event of an adverse decision, legislation must, of course, wait until the tide of public opinion has risen sufficiently to carry amendments to the Federal and State constitutions.

Accident Compensation a Charge Against Industry

Personally, I believe that compensation to injured workmen is a legitimate charge against the cost of manufacture and that the victim of an industrial accident or his dependents should receive compensation, not as an act of grace on the part of his employer, but as a right.

The burden of industrial accidents now falls, in

the most haphazard and unscientific manner, on the victim himself and his dependents, the benevolent employer, the sympathetic fellow-workmen, or the public authorities, or on all of these.

I am inclined to believe that the solution will come eventually by the imposition of a tax on all employers based on the number of employees and the hazards naturally inherent in each industry. The proceeds of this tax should be used, first, to perfect and extend the system of factory and mine inspection so as to prevent accidents and remedy unhealthful conditions of employment; and, second, to provide an insurance fund from which payments can be made to the injured or their dependents.

How to bring about conditions which will accomplish this on a basis fair to all interests is, however, a serious problem. My plea to the members of the Institute, most of whom are vitally interested in all of these questions, is to keep an open mind and not to forfeit their influence in shaping legislation by mistaking mere inertia for true conservatism.

"United States Steel and Carnegie Pension Fund"

In addition to the accident relief plan, but entirely separate and apart from it in its administration, the United States Steel Corporation has established a fund of \$8,000,000 for pension purposes, which, by agreement with Andrew Carnegie, will be consolidated with the \$4,000,000 fund heretofore created by him. The aggregate amount will be known as the "United States Steel and Carnegie Pension Fund;" and the net proceeds will be administered by a board of 12 trustees for the benefit of employees of all subsidiary companies of the United States Steel Corporation. Eight of the trustees have been appointed by the corporation and four by Mr. Carnegie. It is hoped that the details of administration will be perfected so that the plan will become operative January 1, 1911.

The average American workman does not take kindly to any form of paternalism. There is a wide difference, however, between benevolent schemes which impose restrictions on the liberty of the employees and which may be granted or withheld at the whim of the employer, and such general plans as have been outlined, which so fundamentally affect the lives of the ordinary workmen. These are designed to take into account as a proper element in making up costs of manufacture, accidents to and deterioration of the human element, just as in the case of the inanimate machinery or equipment. While the altruistic feature seems to be the most prominent, these plans really have a broader basis in the economic fact that the employer cannot reasonably hope to be permanently successful unless his workmen are also prosperous and therefore contented.

The Seven-Day Week

In conclusion, I would like to emphasize again the importance of a question on which it was my privilege to present a paper to the Institute at the dinner following the annual meeting on May 27—namely, the seven-day week in the iron and steel trades. At that time I said:

As you are aware, the United States Steel Corporation has recently taken some advanced steps in matters vitally affecting the relations between our various companies and their employees, namely: the reduction of seven day labor to a minimum, the establishment of a system of accident and accidental death relief, and the establishment of a pension system.

In considering the first named, i. e., the question of a seven-day week, we were, of course, met at the outset by the difficulty of adjusting a six-day week to the operations which are necessarily continuous, and which are generally so recognized even by the most radical opponents of the seven-day week. This refers particularly to such departments as the blast furnaces. The corporation has not yet been able to devise a practical working system by which the men employed at these continuous operations can be given one day off in seven, and the purpose of this paper is to invite the co-operation of other companies operating blast

furnaces, with a view to devising some workable plan. It is my own deliberate judgment, after a period of almost thirty years' continuous connection with the industry, the early part of which was passed in manual labor in the mills, that the present conditions which necessitate the employment of the same individual workman twelve hours a day for seven days a week are a reproach to our great industry and should not in this enlightened age be longer tolerated.

In response to this appeal, a resolution was passed referring the matter to a committee of five to consider the subject and report later. I understand the chairman has appointed this committee, selecting as its members men who have had large practical experience in the handling of blast furnaces and steel works.

The following comments were made by the leading trade journals:

The Iron Age, June 2, 1910.

With full appreciation of the difficulties involved in the proposal thus put before the steel manufacturers of the country it may safely be said that they are not insuperable. With their record for the solving of problems that have repeatedly blocked the advance of the industry, the engineers and managers who have done so much to put American steel works practice in the forefront will not be willing to confess failure in advance when thus challenged to bring about a much-desired change. Ore unloaders, traveling cranes, charging machines for open hearth furnaces, automatic skip hoists, pig iron casting machines and the whole list of mechanical improvements that have been steadily cutting down the exhausting drudgery of iron and steel works operations, have been the response of engineers to the constant demand for new economies in production.

It will scarcely be claimed that the substitution of a six-day week for a seven-day week and the abolition of the 84-hour week in the iron industry are of less consequence than the ends served by any of the mechanical improvements mentioned.

The Iron Trade Review, June 9, 1910.

The question of Sunday labor is not necessarily a religious one at all. It is a well-known fact that man is not so constituted that he can work year in and year out seven days a week for even less than 12 hours a day and be much better than an animal. There is no time for enjoyment, no time for self-improvement, no time for such intercourse with members of one's family. Work means degradation. Hard as these conditions are, the difficulties of abolishing them have been many, and have been due not merely to the dilatoriness of some manufacturers, but also to positive opposition of workmen and labor unions, who fought against reducing the hours of labor if accompanied by a corresponding reduction of pay.

A single employer or number of employers could not reduce the working hours without reducing the pay, because the companies having longer hours would be at a distinct advantage. It is not even possible for one part of the country to adopt the short hour system unless a similar policy is followed in other parts of the country. This has been clearly demonstrated in the case of San Francisco, where the adoption of the eight-hour day has proved ruinous to many industries, simply because they could not compete with other parts of the country where the nine and ten hour systems prevail.

If this Sunday work is to be reduced to a minimum, it is extremely desirable that the largest number of employers possible be enlisted in the movement, and, for this reason, such an organization as the American Iron and Steel Institute promises to be could have very great influence in bringing about the proposed reform.

The report of the committee appointed by Chairman Gary to investigate the Sunday work question will be awaited with keen interest. It will be found impossible to abolish Sunday work entirely, especially in the case of the blast furnace, but by increasing the number of employees every man can be given one day off in seven, as is done by seven-day newspapers to their employees.

President Taft has said: "The man who does not hope for better things and does not believe that better things can be brought about, is not the man likely to bring better things about." The encouraging sign of the times is that men who believe in better things and who are in position to give effective help in bringing them about are now taking an active interest in these questions.

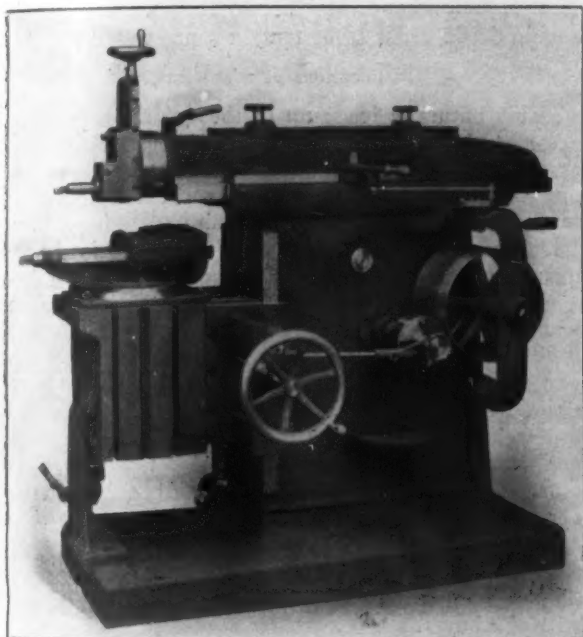
The problems confronting us are not easy ones, but they certainly present less difficulties than those which have been surmounted in other lines. It is not to be expected that men who have been so conspicuously successful in the development of mechanical appli-

ances and processes and in the administration of immense enterprises will fail to solve these social problems when they are confronted with the absolute necessity for their solution.

The Steptoe 26-In. Triple Geared Shaper

A new 26-in. triple geared shaper has recently been brought out by the John Steptoe Shaper Company, 2951 Colerain avenue, Cincinnati, Ohio. This machine is designed to take very heavy cuts with high speed steel tools and is geared in the ratio of about 42 to 1.

Two large diameter rack gears drive the ram, and this construction permits the passing of bars through an opening in the top of the column for keyseating, which is impossible where only one large gear is used. The rack with which these gears mesh is cut from a



A New Triple Geared Shaper Built by the John Steptoe Shaper Company, Cincinnati, Ohio.

solid steel bar and the teeth are staggered to avoid excessive jarring at each end of the stroke and transmit an even pushing strain through both gears. The shifter dogs are placed conveniently on the top of the ram, which allows the dogs to be made larger than usual. The plate for shifting the belt is slotted eccentrically, so that one belt is shifted before the other. This reduces the squealing which is often heard where shifting belts are used on triple geared shapers. An outer support of large proportions is furnished for the driving pulley shaft.

The head may be swiveled to any angle. This adjustment is controlled by the lever at the back of the head, and pushing it from the operator loosens the head for swiveling, while the reverse movement instantly locks it. The table and the apron are both slotted on top and afford very liberal clamping surface. The table support can be quickly adjusted for different heights by the lever at the outer end and has a roller which runs on a plane surface under the table to permit lateral feeding of the table.

The edge of the graduated swivel vise base is beveled at an angle of 30 degrees, so that it can be more easily read. For preventing the upper jaw from rising when the work is being tightened in the vise, the upper jaw has a firm grip around the lower one. Where extreme accuracy is desired and this grip is not sufficient to overcome the tendency of the upper jaw to rise, two additional clamping bolts are provided, which project through the upper jaw, and when fastened will overcome this tendency.

The column, ram and base are heavily ribbed and braced. Cast iron bushings and ring oilers are provided for all the shaft bearings in the column and the shafts are turned with spiral oil grooves to secure the proper distribution of the lubricant over the entire bearing. All the wearing surfaces have flat gibs and in addition the gib adjusting screws in the ram and harp slide are provided with lock nuts. Hand wheels are provided, which will be found to be convenient for adjusting the lead and harp slide screws.

New Bailey Sheet and Pair Furnace Installations

George J. Hagan, Pittsburgh, Pa., sole licensee for the Bailey patents, has received from the Berger Mfg. Company, Canton, Ohio, an order for three additional Bailey combination sheet and pair furnaces, making a total of six furnaces ordered for that company's plant within the last seven months. The first furnace was installed under a guarantee to save 25 per cent. in fuel. The guarantee was exceeded, as the result of a test showed a saving of 40 per cent. over the furnace previously used. The old furnaces had averaged 682 lb. of coal per ton of finished sheets, but with the combination furnace the consumption now averages 404 lb. When the cost of fuel is considered, a greater saving is made than 40 per cent., due to the combination furnace being equipped with a mechanical stoker which enables slack coal to be used as against the dearer run-of-mine coal.

The McKeesport Tin Plate Company, McKeesport, Pa., has placed with Mr. Hagan an order for the furnaces and gas producers that will be required for the second addition to its plant, the first addition installed by him about a year ago having proved so satisfactory as to prompt President E. R. Crawford to write to Mr. Hagan an exceedingly flattering letter. This last order will be completed, and the apparatus ready for operation by December 1. The Allegheny Steel Company, Pittsburgh, has also ordered for its plant at Brackenridge, Pa., Bailey combination sheet and pair furnaces.

The plans and specifications sent out for the new Gary plant of the American Sheet & Tin Plate Company call for combination sheet and pair furnaces of the Bailey type. Several of the plants of that company are already using the Bailey Furnace, notably the Vandergrift Works.

Mr. Hagan is district sales agent for the American Stoker Company, New York, and reports sales of six mechanical stokers, duplicate order, to the Berger Mfg. Company, and six stokers, second order, to the Canton Sheet Steel Company, while an order has also been received from the Allegheny Steel Company. These machines are all eccentric-shaft driven.

International Exhibition at Budapest.—The National Association of Hungarian Ironmongers (Magyar Vaskereskedők Országos Egyesülete) will hold an International Exhibition of Novelties and Patents of the Iron and Engineering Industry in the Industry Palace at Budapest, May and June, 1911. The principal articles to be exhibited are iron and steel manufactures, apparatus for domestic use, technical devices for manufactories, motors and models or designs of new machines. The exhibition is expected to offer manufacturers an opportunity to extend their trade and to secure to inventors the development of patents. It is stated that many patents registered in Hungary lie idle because the inventors are unaware of a way in which to have the invention properly worked. Applications for space will be received until November 30, 1910. The director is Armin Biro, general secretary of the Association of Hungarian Ironmongers, Budapest.

Paying Factory Salesmen's Expenses

Who Should Pay the Expenses of a Representative from the Factory When Sent Out at the Request of a Dealer to Help Close a Deal?*

PAPERS BY FREDERICK L. EBERHARDT, NEWARK, N. J., AND CHARLES H. NORTON, WORCESTER, MASS.

FREDERICK L. EBERHARDT'S PAPER

I realize that this is a question which is likely to be productive of much discussion, and perhaps difference of opinion, principally for the reason that there are so many different conditions that may enter into each separate occasion when assistance from the factory may be required.

The first thought which will undoubtedly occur to those who have not given the subject any consideration is, Why should there be any question as to who should pay such expense? The agent is usually given certain territory, in which he is protected; inquiries which come directly to the factory are sent to him and orders are credited to his account. He is paid a certain percentage for making a sale, and he is presumed to be posted on the machines he is agent for and for the sale of which he is given a commission. The agent has to pay his salesmen's salaries, their carfares and other expenses incidental to effecting a sale. Therefore why should he not also pay the expenses of a factory representative when it is necessary to call on the latter to help close a deal for which he (the agent) is to receive a commission? This, as I said, would probably be a first thought, but after one goes into the subject, deeper he finds that there are other sides to the question, and the answer to it will depend largely upon the nature of the machine in question and how frequently assistance is required by the agent.

Why Is It Necessary to Call on the Factory for Assistance?

The answer to this is found in the fact that nearly all of the dealers handle from a dozen to 50 different kinds and makes of machines, tools, &c.; and some of them even more than that number. With a limited force of salesmen, it would be practically impossible for the latter to be thoroughly posted on each line of machines they are trying to sell; in fact, I have found that sometimes the factory representatives themselves are in doubt as to the possibilities of machines, and it is occasionally necessary to make tests before the desired information can be obtained, the conditions varying with each case.

In other cases, what might be termed a "wall of reserve" has been built up between the agent and the intending purchaser, due to trouble over some previous sale, perhaps of a machine of some other make, and, while the purchaser might want a certain make of machine, he would prefer to do business directly with the factory representative rather than with the agent. In such cases the agent shows his wisdom in calling on the factory rather than lose the sale. This is where the so-called factory "missionary" comes in—the man who combines practical factory knowledge of the capabilities of the different machines with selling ability.

When Assistance Is Required

It has been my experience that with the simpler machines the agent does not require much assistance. The services of the factory representative are generally required in introducing a new line of machines, with which the agent and his salesmen are not as conversant as with the older line. Again, when selling machines that are of a more or less complicated nature, where, before deciding the customer is in a state of doubt,

but eager for practical information or pointers to guide him in arriving at a final decision as to what will best be suited for his requirements—where due, perhaps, to inexperience or lack of information—the agent or his salesmen is unable to speak advisedly. This, then, is when the need or call for the man from the factory originates and is found to be necessary; and it is too often because the salesman has not sufficiently posted himself beforehand, at least to the extent which he should do, in order to be truly a representative.

Qualifications of a Salesman

This naturally leads up to the qualifications to be possessed by a salesman. One finds a great difference as to the ability and qualifications of various agents and their salesmen, which makes the call for assistance from the factory at times absolutely imperative. I feel more attention should be given this point by the manufacturer, requiring that the agent and his salesmen keep better posted and in better training. The one who is best fitted for his work will certainly book more orders and will require less outside assistance than one who does not measure up to the same qualifications. This implies that a salesman, to be efficient and to excel, must first be adapted by nature to the work, and, second, be well trained and posted. He must not alone be a good judge of human nature, but a close observer; he must exercise tact, and possess a certain analytical turn of mind so as to quickly and thoroughly absorb the functional operations and characteristics of the several machines which he is called upon to discuss with the buyer.

A salesman, to be efficient and successful, must be able to convince his customer that his product is the best one on the market and thoroughly suited to the purpose. To convince another of this, he must believe it absolutely himself. To have this confidence, he must have a complete knowledge of his own and competing lines, and one of the best places to obtain this is from the manufacturer. Such a salesman, if of good personality, and having the knack or ability of imparting good, truthful argument and helpful suggestions, will accomplish results and not require much direct assistance from the factory.

Some manufacturers, recognizing the difficulty of securing agents thoroughly versed in the construction and capabilities of their machines—frequently owing to the technical or special nature of the machines themselves—have established their own agencies, manned by specially trained experts from their factories. Some of these manufacturers claim that direct representation is the only way.

What Is Fair for the Manufacturer to Do

But where we are represented by agencies which handle a number of different makes and kinds of machines, as most of us are, I believe it is fair for the manufacturer to expect to be required to do a reasonable amount of assisting by personal representation with prospective customers, and without seriously considering the question of expense. I feel, however, that in such instances both the agent and his salesmen should be on the spot so as to be in a position to thoroughly absorb all of the information imparted at such an interview or presentation of the subject in that particular case; also, that both should have previously

* Read before the National Machine Tool Builders' Association, New York, October 26, 1910.

visited the manufacturer's works, seen the machine in action, and thoroughly informed themselves as to its scope, and become familiar with all or as many of its characteristics as is possible. After a certain amount of this, so to say, "self-instruction," a salesman should be able to present without great difficulty, to another customer having similar requirements, all of the arguments previously presented.

The manufacturer should not be required too frequently to send a representative from the factory to assist in effecting a sale. I would not, however, advise a hard and fast rule, as no two circumstances are entirely alike. There are times when the fact of a personal representation, direct from the factory, adds a certain mutually beneficial tone; also, when the size of the order and the circumstances warrant, I believe it is good business for this to be done, and the expense to be borne by the manufacturer, or, if much of this work were required, the manufacturer and agent might divide the expense. If an agent were compelled to defray the factory representative's entire expenses whenever he felt that the services of the latter were required, it would be simply human nature for him to defer calling on the factory, and he would try to close the order himself, and thus avoid the expense. Such action might, in many cases, be the means of losing sales—not only of that particular order, but also of subsequent orders, that would otherwise have benefited both the agent and the manufacturer.

Sales Price Should Carry the Expense

I do feel, however, that this item of expense, which is an added burden on the manufacturer's profit and which is too often overlooked by the agent and the buyer, could be greatly minimized if the agent would give more attention to the careful selection of his men, see that they are better trained and afford them more opportunities to frequently visit the manufacturers' shops. Too few salesmen are well or sufficiently posted (the fault of either the agent or the manufacturer—sometimes both); too few have the ability to acquire and grasp the practical information which the buyer wishes to know in order to enable him to satisfactorily and confidently make up his mind that the machine in question is going to be the right one for his work, from a practical, economical and modern standpoint. It sometimes happens that a salesman, in offering a machine, will fail to consider whether a customer has other machines of a similar character equipped with tools, fixtures or cutters, which possibly it would be advantageous and sometimes imperative to have interchange with the new machine; or he will recommend a machine of insufficient capacity, &c.

For lack of this information, too often only obtainable on the spot, the salesman unconsciously entails great annoyance and delay to the customer, and involves added expense to the manufacturer. For the correction of the difficulties referred to, I believe it is necessary for the agent and salesman to "measure up" better to the responsibility of their positions.

I would not, however, overlook the position and responsibility of the manufacturer. He should see that both the agent and his salesmen are amply supplied with all information and assistance to the above end, believing that with a hearty, sincere co-operation less personal assistance from the factory will be required.

A Phase of the Dealer's Side

In going over the merits of the subject with a dealer, he quite naturally unfolded some views of his side of the case, and said: "In reverse cases, would the manufacturer pay the dealer for straightening out troubles on his machines which are not right when sent out? We have had considerable of this work to do, and surely if we had to pay the manufacturer for his services we would insist upon his paying us for ours when the case was reversed."

This phase of the situation, from the dealer's side, may at times be more or less true, depending upon the circumstances; it, however, only emphasizes the old saying that there are always two sides to a story, and each side should be disposed to play fair.

The proper question to ask, it seems to me, is not who shall pay the expenses, but when shall the expenses be paid by the manufacturer, or, rather, when shall the agent call on the manufacturer, at the latter's expense, to assist him. This matter, then, resolves itself largely into a question of the personal equation, and results will vary accordingly. It is up to the manufacturer, the agent and his salesmen, and the amount of interest and energy the latter are willing to put into their chosen work. If the agent or the salesman possesses the right mettle he is bound to succeed, but only by close attention and personal effort. It seems to me that these thoughts surround and govern the whole subject, at least so far as trade in this country is concerned. The more they are considered and practiced, the better will be the results obtained.

CHARLES H. NORTON'S PAPER

This question raises other questions which the Norton Grinding Company feels are related to this one, and quite as important:

1. How can the maker of machine tools be sure that he or his tools shall be understood before they are sold, and afterward?
2. How can the maker be sure that the right tool is recommended for the work to be done?
3. How can he be sure the right equipment is selected and specified?
4. How can he satisfy the customer that the tool is suitable after it is installed?

We have not found it practical to rely upon the agent and his salesman alone for efficient service along these lines. We find the agent and his salesman very helpful to us in introducing our machines and in the care of customers generally, and we would not think of dispensing with their services; but we do not believe any one can correctly present a machine tool to a buyer unless he has either designed it or is familiar with its construction by the actual work of constructing it, or that any one who has not actually produced work with it can correctly estimate on work for a new customer.

One not familiar with a tool is poorly fitted to defend it against the misstatements of competing agents when in conference with a doubting buyer. Selling a machine tool is very different from selling cloth or cigars. It is nothing to say that "they are made by the best people, and we put the best goods into them." Therefore, the one who is discussing the question with the doubting buyer must be absolutely familiar with all sides of the question.

Reaching the Customer Through Agents

It seems necessary to reach the customer through agents. This being true, we believe it is necessary to train a man in our own works who shall act with the agents to secure and maintain a correct understanding between the customer and ourselves. The average foreman and workman cannot be trusted to correctly look into the merits of a proposed tool, and the average buyer buys what his foreman says is best; so it becomes necessary for the maker to be sure his tool is understood by the buyer, in order to secure the order.

To secure such understanding it is necessary that some one who knows shall present the case, and what is more convincing than to be able to say, "I know, because I have come up in the works where these tools are made, and I will come here to your works and make good if you buy." It is also necessary that he should go when the tool is sold and be able to take off his coat and cuffs and actually teach the workman to produce work as guaranteed.

S. DIESCHER & SONS

Mechanical and Civil Engineers

We found that we were constantly in trouble because of the lack of mechanical knowledge on the part of the salesmen, and any effort on their part to familiarize themselves with our tools was bounded by a few hours between trains and without the removal of their cuffs. We felt that we must be represented by trained mechanics, men who had trained in our own work, and who could at all times keep us in touch with all the facts, favorable as well as unfavorable, for it would seem that the average salesman is very quick to fall into the customer's way of thinking and to assist him by assent to the customer's criticism, rather than to defend intelligently the machine he is representing.

A man from the works is better prepared to meet unjust criticism and to satisfy the customer of the correctness of his machine, as well as to satisfy the works of errors they may have made in the machine and that would justly merit criticism.

We have an arrangement with our agents in regard to commissions by which we are able to furnish a man from the works to work with our agents, although this arrangement does not pay all of the expense; a part of it is borne directly by us. We believe, however, that it is the most profitable way to proceed, and so far it has worked out well.

At first the plan was looked upon with disfavor by all but one of the agents. Now all agents like it. Our men work with the agents, but continue in our employ, we paying their salary and all expenses. They, of course, do not take the place of the agent and his salesman, nor do they assume anything belonging to the salesman. They work with the salesman, assuming the authority for all estimates or guarantees, explain mechanical features, render intelligent reports to us of all criticisms from our customers and all defects of our tools as they see them in use.

The Value of Co-operation

Working, as they do, with the agent and salesman to assist in making sales and satisfying customers, they are brought face to face with all sides. Their familiarity with the technical features and personnel of our works enables them to report intelligently to us, and enables us to understand them, and to correctly diagnose all cases and prescribe the remedy, with the result, as we now believe, that we have a better understanding of the user's position and the buyer and user have a better understanding of our tools.

We believe that in cases where such a plan as we follow is not in force, and when, on occasion, the agent shall ask that a man be sent to assist him, it is for the best interest of the maker to send a man at his own expense, until some arrangement can be made. It has always been our habit to send a man on such occasions, paying all of his expenses.

We feel that it is for the best interest of the machine tool maker to be more directly represented, and in saying this we do not depreciate in the least the dealer and salesman. We believe they are necessary to success.

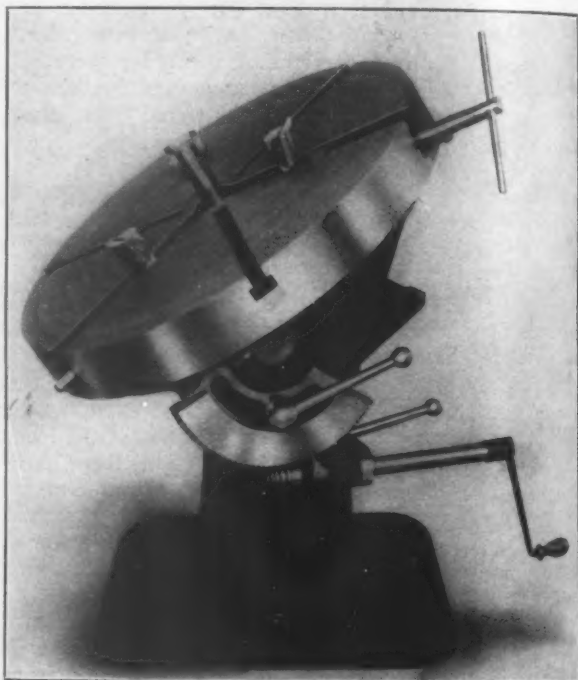
Employees Remembered by a Deceased Manufacturer.—Isaac Smith Remson, president of the I. S. Remson Mfg. Company, Brooklyn, N. Y., who died October 13, has provided in his will that as "a certain amount of success in general business is due to faithful employees and they are entitled to a share of the assets which have naturally been increased by their co-operation," he leaves to the officers and employees of the company certain sums to be reckoned as follows: After one year's service and up to five years, \$100 for all or a portion of the first five years' service; after five years' service, the sum of \$50 per year up to ten years; after ten years, \$100 per year for the entire length of further continued service, no fraction of years to be allowed. The company was

formed in 1890 and is thus twenty years old. It builds wagons and manufactures automobile accessories.

The Gang Universal Drill Table

The William E. Gang Company, 1543 Queen City avenue, Cincinnati, Ohio, has recently placed on the market a table for radial drills, with chuck attachment which is universal in every respect. The upper part, which carries all of the operating levers, swivels in a complete circle about the base. In addition to this rotary movement the chuck can also be turned upon its center regardless of the angle to which it is tilted. This latter movement is accomplished by a crank, worm and large diameter worm wheel segment graduated from 0 to 90 degrees, the last insuring the setting of the table accurately at any desired angle.

The chuck, which was originally designed for drill-



A New Universal Table with Chuck Attachment, Made by the William E. Gang Company, Cincinnati, Ohio.

ing copper blast furnace tuyeres or work of a similar nature, is of the three-jaw independent type, 26 in. in diameter, and will hold work of round or irregular shape. The jaws are made with a false front for chucking castings which are tapered both internally and externally and adjusts itself to any taper within wide limits. A spring to keep the false jaws tilted back toward the center of the chuck is also furnished, its purpose being to render the placing of tapered bore work in the jaws easy, as it is only necessary to loosen one of the three jaws to remove or replace work in the chuck. These jaws are reversible and can be removed if desired, so that the chuck can be used as an ordinary round table.

Instead of the 26-in. chuck illustrated, this table can be furnished with a 26-in. plain round top or a plain square top measuring 2 in. less on a side.

The Lake Superior Corporation has made the first shipment of iron ore from its Magpie iron mine in the Michipicoten district to its plant at Sault Ste. Marie, Ont. A railroad has been built to the new mine, from which shipments are expected in time to equal those from the Helen mine, which is 15 miles from the Magpie. These two properties when fully worked are expected to make the Sault works independent of Minnesota ores, which are now used in part.

A New Gould & Eberhardt Gear Hobber

The Latest Automatic Machine for Spur, Worm and Helical Gears

One of the latest and most highly developed hobbing machines manufactured by Gould & Eberhardt, Newark, N. J., for cutting spur, helical and worm gears is illustrated herewith. The object of the manufacturer has been to develop a machine which would operate at the highest possible efficiency when using high speed steel hobs. With this end in view several parts of the machine have been strengthened and enlarged, and the operation rendered simpler by locating the operating levers in more convenient places. Two sizes of hobber are built, one having a capacity of five pitch in cast iron and six pitch in steel blanks 12 in. in diameter with a 6-in. face, and the other handling blanks 24 in. in diameter by 10-in. face width, with a capacity of four pitch in cast iron and five pitch in steel. These machines are suitable for all classes of small and medium sized gears, such as change gears, gears for textile machinery, automobile transmission and timing gears, gas engine valve motion gears, herringbone gears when made in halves, steering gears

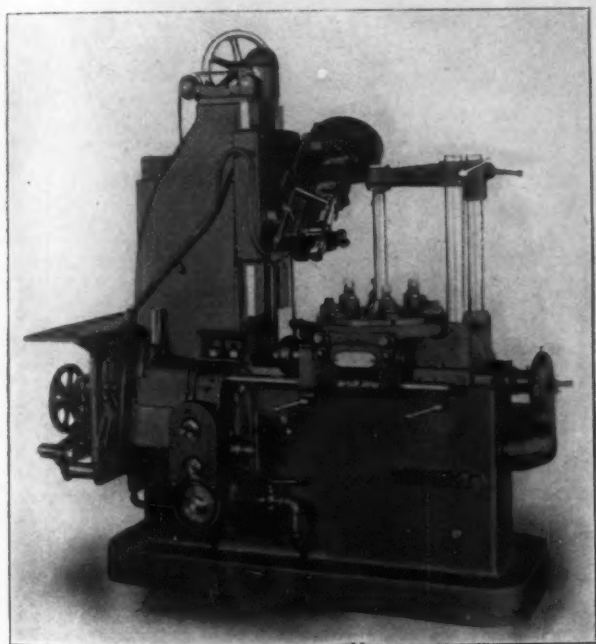
tional cost. In the machines equipped with this attachment as soon as the gear has been cut to the desired depth the feed is automatically stopped. The work table revolves upon an antifriction washer in the work slide, and at this point there is a channel into which the oil supplied to the cutters and the chips drop. From this channel they are carried to the front of the slide and drop into the base of the machine, thus preventing the chips and the oil from flowing on the floor and keeping the machine clean.

One work arbor is furnished with each machine, but is left blank so that it may be finished to required size. The arbor is mounted in a convenient manner, and is supported rigidly at its outer end, so that it may be used up to the full rated capacity of the hobber. This support is a very important feature, especially with the long and slender mandrels employed in cutting helical gears of extreme angles, and when several blanks are mounted on the arbor at once as it makes it possible to cut a greater number of gears at one setting. The support can be swung to one side, which makes it possible to remove the finished gears and mount new blanks on the work arbor conveniently, while by removing the two uprights carrying the triangular supporting arm, gears having a larger diameter than that for which the machine is regularly rated may be cut.

The indexing worm wheel is of the split type, and is hobbled in place which is said to insure a very accurate wheel. High-grade machinery steel is used for the worm, which is hardened and ground and runs in an oil bath. The teeth of the gear are of coarse pitch. The worm is mounted in rigid bearings so arranged that it can be disengaged from the indexing wheel conveniently, and the latter revolved by hand to ascertain if the mandrel and gear blank run true. This feature is convenient and also important because if accurately running gears are to be secured they must run true while being cut. A perfect fit is always maintained between this worm and worm wheel, and the former has a micrometer adjusting device by which the work can be adjusted circumferentially without disconnecting any mechanism. This is very essential in cutting helical gears or resetting a spur gear which has already been cut and the design of the device is such as to adapt itself readily to a very minute adjustment and still maintain a positive connection between all parts.

In cutting helical gears and especially when cutting the first one of a size, it is frequently desirable to take two cuts to obtain the correct tooth thickness. A patented device is furnished to set the machine at the original or zero position when commencing to cut a gear wheel of this type, and a second cut may be taken by simply returning the machine to this zero position. This device is said to save considerable time and do away with the experimental adjustments which would otherwise have to be made. In the absence of a resetting device it would be necessary either to cross the belt and run the machine backward until the cutter slide had returned to its original position or loosen the gear on the mandrel, or else take off the change gears so that in starting the second cut the cutter would cut uniformly on each side of the tooth. A complete set of indexing gears is furnished for cutting every number of teeth from 10 to 100, and also a large number of teeth up to 400, while the machine is so arranged that by special calculation spiral gears having prime numbers of teeth may be cut without employing special indexing gears.

A vertically adjustable cutting slide, carrying a supplemental slide which may be swiveled and adjusted to any angle, is mounted upon the stanchion at one end of the frame. This supplemental slide is counterbalanced and may be adjusted vertically by hand or power, the hand wheel being mounted at the top of the stanchion near the side where it can be conveniently reached by



A New Type of Hobber for Spur, Helical and Worm Gears Built by Gould & Eberhardt, Newark, N. J.

for automobiles and worm feed gears for lathes and drill presses.

The face plate or revolving work table is made in one piece with the index worm wheel, a form of construction which is claimed to be very rigid and reduce torsional strains to a minimum. The work slide furnishes a rigid support at its outer periphery, and the table is arranged so that it may be revolved in either direction to accommodate right or left hand gears. The work slide on which the table is mounted can be adjusted longitudinally on the base of the machine for different diameters of blanks or depths of teeth and is also employed when cutting worm wheels. For reading the center distance between the cutter and work spindles and also for obtaining the desired center distance in hobbing worm wheels a scale with vernier attachment is provided. On the standard machine this adjustment is made by hand with a crank handle, but if desired an automatic adjustment known as an automatic in-feed, which forms part of the machine shown in the engraving, can be furnished at a slight addi-

the operator. The cutter spindle has powerful gearing and is arranged to swing above the horizontal when cutting either right or left hand gears, and when the cutter spindle is swung to one side or the other means are provided to have the spindle revolve in the proper direction. For taking up the wear taper wedges are provided. To secure symmetrically formed teeth it is important that the tooth and the hob be set central with the work arbor; for this purpose a gauge is provided which is so arranged that it is always in place in the slide. Thus the gauge is in position when the operator requires it, and the hob may be set centrally regardless of whether the work is in the machine or not.

The power feed is down for either right or left hand gears and is of the draw cut type, the feed parts being arranged in the base of the machine and

the bed of the machine. Electric motor drive can be readily applied, and an adjustable speed motor with a 3 to 1 ratio and a maximum speed of 1500 rev. per min. is recommended.

The Anderson Gear Rolling Machine

A Radically New Process for Forming Gears

Harold N. Anderson, mechanical engineer of the Speedwell Motor Car Company, Dayton, Ohio, has invented the machine which is illustrated herewith for rolling the teeth in steel spur blanks. Fig. 1 shows the operating side of the machine (since the photograph was taken the pulley at the back has been replaced by a large gear driven by a pinion), Fig. 2

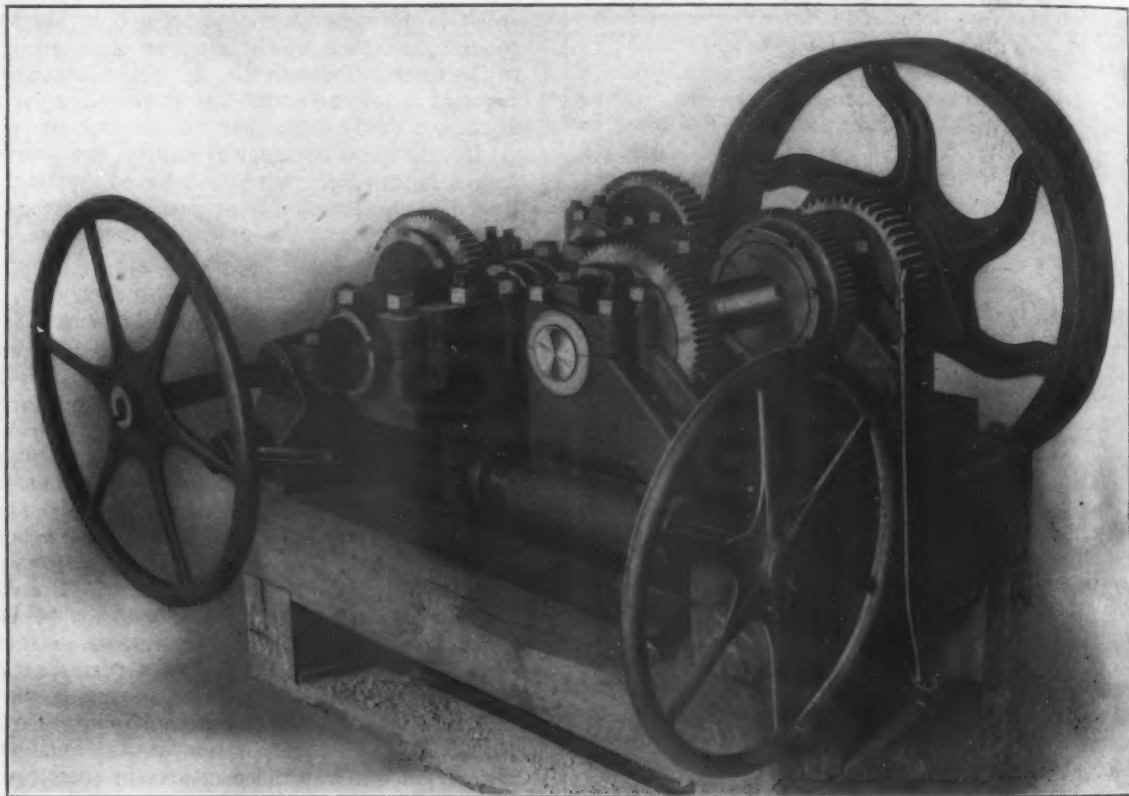


Fig. 1.—Operating Side of a New Gear Rolling Machine Invented by Harold N. Anderson, Dayton, Ohio.

conveniently engaged or disengaged by a handle on the side. The advance of the feed is controlled by the rotation of the work regardless of the number of teeth or diameter being cut, and is a definite amount for each rotation of the spindle carrying the blank. The feed change gears are located at the rear of the machine and are placed according to the indexing chart or in the position obtained by calculation. The speed of the cutter is regulated by a large diameter cone pulley running on a sleeve bearing which takes all the strain due to the pull of the belt that would otherwise come on the pulley shaft. This method of support eliminates the necessity of an outer support on the shaft and is said to insure the proper meshing of the driving gears on this shaft at all times. A great variety of speeds are obtainable at the cutter spindle, and the proper one for the cone pulley may be selected from the index furnished with the machine.

These machines can be arranged to cut steering gears with single, double, triple or quadruple thread milling cutters where the lead is greater than 2 in. at a slight additional cost, the regular machine handling worms under 2-in. lead. An oil pump is furnished which is attached to the side of the machine and driven by gears capable of easy disconnection when it is desired not to use the pump. An oil pan which catches any drippings from the machine is cast around

gives details of the machine and Fig. 3 shows a pair of gears rolled on the machine.

The advantages claimed for this process are cheapness, a much stronger tooth, a generated and developed tooth, elimination of the tendency to warp, ability to use any kind of steel and the impossibility of eccentricity in the gears. The whole periphery of the gear is rolled in one or two heats depending on the size of the blanks, which means that as a general thing the gear is not in the machine for a period longer than 45 seconds. In rolling the teeth, each one is practically forged by an enormous side pressure on each blank which tends to make the metal in the teeth very dense and hard. As compared with a cut gear, the tendency of a rolled gear to warp during case hardening is claimed to be a great deal less, as the structure of the metal at the periphery is changed while hot, and there are no internal strains to be relieved in the case hardening operation. It is claimed that this process can be employed with any alloy steel gear the blank of which can be drop forged and in silicomanganese steels, which are almost impossible to machine, the teeth can be rolled and ground and the hole ground, thus completing all the operations by forging and grinding. The gears are held at the periphery in a chuck, and the center hole is bored as a last operation, the position of the work being adjusted from the pitch

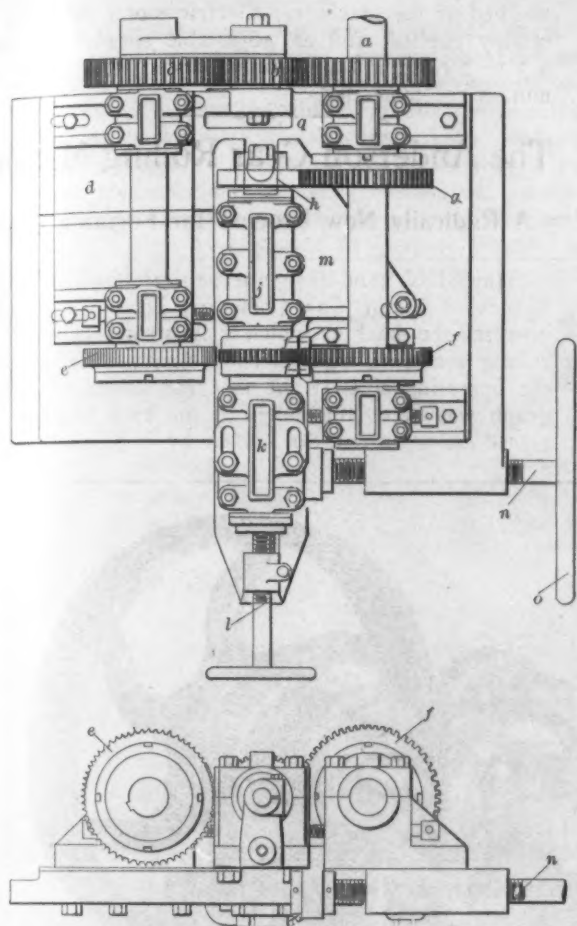


Fig. 2.—Plan View and Elevation of the Machine, Showing Details.

line of the teeth. In this way the hole must be concentric with the pitch diameter, whereas in cutting a gear there is possibility of eccentricity if the arbor springs or is untrue.

As will be noticed from Fig. 2, the machine is very simple. It comprises the driven shaft *a* which drives the shaft *d* through the gears *b* and *c*. The break down or roughing gear *e* is mounted on the end of this shaft, while on the end of the driving shaft is mounted the finishing gear *f*. A timing gear, *g*, is also mounted on this shaft and drives the gear *h*, which is of the same size as the gear to be rolled. The gear blank *i* is held between two chucks *j* and *k*, whose

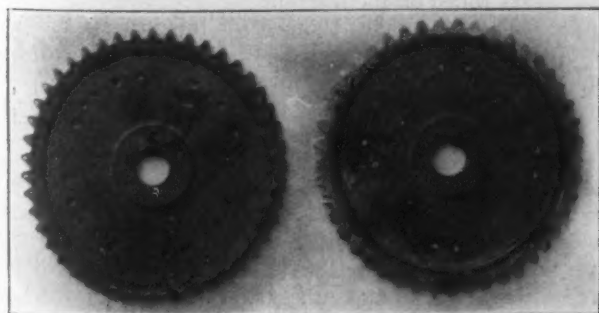


Fig. 3.—A Pair of Spur Gears Rolled on the Machine.

movement is controlled by the screw and hand wheel *l*. The entire carriage *m*, which carries the chucks and the gear blank, pivots on *q*, which is in line with the edge of the gear *h*, and a screw, *n*, controlled by the hand wheel *o* oscillates the carriage.

In operation the blank *i* is inserted, and the carriage thrown over toward the break down gear which does the roughing work. This operation is very interesting, as the blank to be rolled is only a trifle larger than the pitch diameter of the finished gear. This gear serves to break up the metal, and to force it out to a

larger diameter. After this has been done the blank is then pressed into contact with the finishing gear *f* until the proper depth of tooth is reached and also the proper diameter of the gear. At the same time the surplus metal thrown out on the end of the tooth is trimmed off by the cutter *p* by the movement of the carriage which brings the edge of the blank in contact with the cutter. The gear is kept in this machine until a permanent set is reached, and is then pushed off the arbor by the stripping device which cannot distort it. After the tooth is rolled it is said to be absolutely free from scale.

Although primarily designed for rolling spur gears, the process can also be applied to bevel gears with an even greater decrease in the cost. In roughing the teeth of a bevel gear by this machine the sides of the teeth have the true tooth curve with an evenly added amount of material to be removed in finishing. This result is different from that secured by the ordinary roughing machine which cuts a perfectly straight side to the tooth. Consequently the generating machine is required to remove more stock in rounding the corners at the top of the tooth than on the pitch line.

If very great accuracy is desired, the gears should have a finishing cut, but it is believed that with a further development of this process that these gears can be used in the cheaper grades of motor cars without any finishing cuts.

George W. Perkins on Profit Sharing.—The New York *Evening World* of October 29 contains an interview with George W. Perkins, member of the banking firm of J. P. Morgan & Co., and also a member of the Finance Committee of the United States Steel Corporation, in which he gives his views on profit sharing as a means of avoiding strikes. He claims that the officers of great corporations should remember that such concerns are more nearly public institutions than private property. Speaking of the success of the profit sharing principle as adopted by the United States Steel Corporation and the International Harvester Company, he said: "The corporations of the future must be those that are semipublic servants, serving the public, with ownership widespread among the public, and with labor so fairly and equitably treated that it will look upon its corporation as its friend and protector rather than as an ever-present enemy, above all believing in it so thoroughly that it will invest its savings in the corporation's securities and become a working partner in the business."

A Baltimore Shippers' Association.—Through the efforts of A. E. Beck, traffic manager of the Merchants and Manufacturers' Association, an organization of the shippers of Baltimore and vicinity has been formed, known as "The Shippers' Conference," which will meet monthly. A committee termed "The Conference Committee" meets weekly for the consideration of traffic matters and to devise plans for the adjustment of differences between shippers and carriers. The organization is now arranging for a conference between representatives of shippers and carriers for the discussion of means for the betterment of transportation facilities. The plan is reported as being regarded with favor by the transportation interests.

A paper on the rotary kiln, by Ellis Soper of Detroit, will be presented at the New York meeting of the American Society of Mechanical Engineers, 29 West Thirty-ninth street, on the evening of November 9. Following this paper, Charles Whiting Baker, editor of *Engineering News*, will give an illustrated lecture on the Panama Canal. The date of this meeting has been changed from the customary one, because the meeting would have come this month on Election Day.

The Fay & Scott 16-In. Lathe

A New Geared Head Lathe with Instantaneous Speed Variation

Instantaneous spindle speed variation is obtained in a new type of single belt drive friction geared head lathe developed by Fay & Scott, Dexter, Maine. The tool is fitted as a plain turning lathe without any lead screw and is designed to be belted directly from the line shaft, but if desired a lead screw and compound rest can be applied. Fig. 1 is a general view of the new tool, Fig. 2 is a view looking down on the headstock with the gear guards removed to show the gearing, and Fig. 3 is a section of the headstock taken at right angles to the view shown in Fig. 2. In this tool the following standard modern features have been incorporated: A hollow hammered steel spindle with ground bearings, bronze boxes, a tailstock of the cutaway type, a wide waist car-

riage, a flat inside front track and a double plate bevel gear type of apron with reverse and positive lockout of feeds when cutting threads.

Four mechanical speed changes obtained by friction clutches are provided. These clutches are of the expanding type with cork inserts. The two levers located at the front of the headstock control the changes, which are made while the machine is in motion without any shock to the gears. The sleeve *a*, Fig. 3, carrying the gears *b*, *c* and *d*, is driven at a constant speed and turns on the shaft *e*. The four gears *f*, *g*,

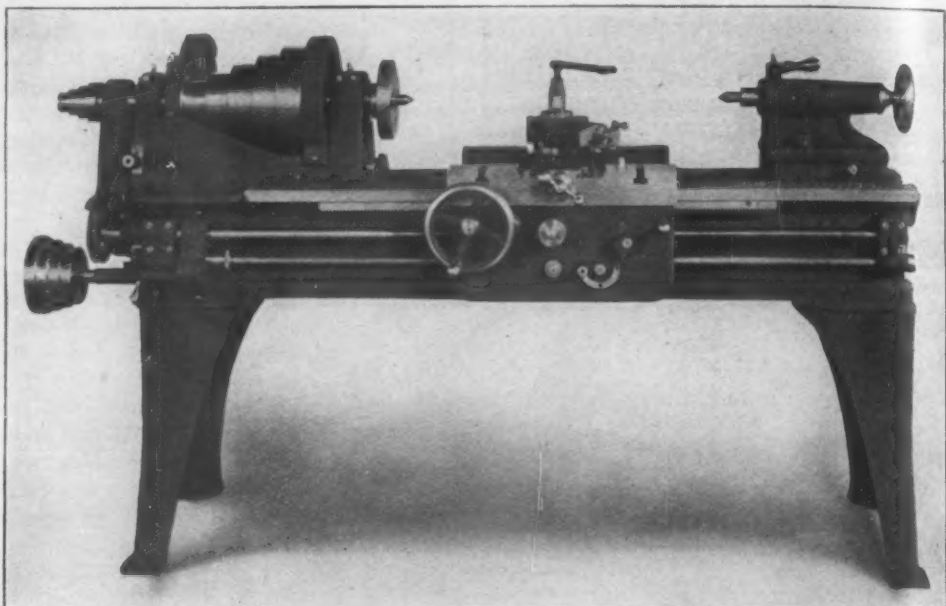


Fig. 1.—A New 16-In. Geared Head Lathe Built by Fay & Scott, Dexter, Maine.

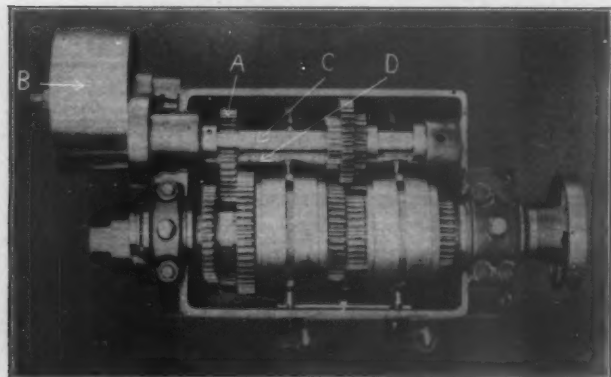


Fig. 2.—View Looking Down on the Headstock, with Gear Guards Removed.

riage, a flat inside front track and a double plate bevel gear type of apron with reverse and positive lockout of feeds when cutting threads.

h and *i* are mounted on four friction bands, *j*. These rotate idly on the spindle *k*, but can be bound thereto by the four frictions *l*. These last four gears are always in mesh with those on the sleeve *a* and drive the spindle at four different speeds. The engaging of two conflicting ratios of gearing simultaneously is impossible. All the working parts are readily accessible and the friction clutches have a single adjustment by a screw driver. The entire mechanism runs in an oil bath, eliminating noise.

Power is transmitted from a single driving pulley, *B*, on the back of the tool, through the reducing gears on the shafts *C* and *D* to the gear *A*, which meshes with the gear *c*. In this way the spindle is relieved of all belt pull, tending to force it out of line and runs true at all times.

Reverse speeds can be obtained by using a two-friction countershaft, or a greater number of speeds with a variable speed countershaft. The equipment regularly furnished includes all the accessories for a tool of this nature, while the following can be furnished as extras: Taper attachment, oil pan and turrets fitted to the carriage or the Vs.

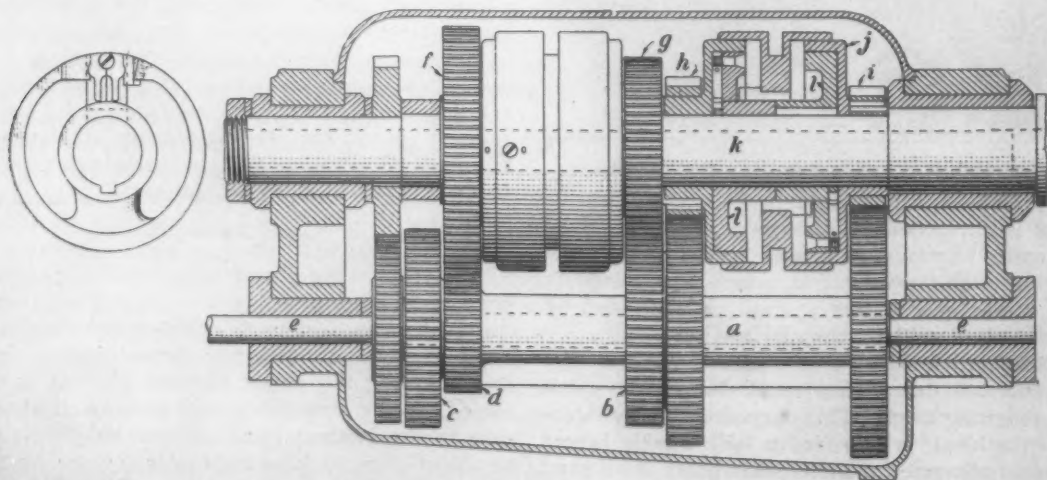


Fig. 3.—Vertical Section Through Headstock, Showing Speed Change Gears.

Some Difficult Special Castings

An order recently completed by the Marshall Foundry Company, Pittsburgh, Pa., for the St. Lawrence River Power Company, Massena Springs, N. Y., comprised a number of special gray iron castings which are interesting. Fig. 1 shows an end and side view of an upper draft tube thimble and Fig. 2 is a cast thimble for a thrust bearing, while Fig. 3 shows one of these thimbles being finished in a boring mill. Fig. 4 is a view of a carload of castings forming an export shipment.

The thimble shown in Fig. 1 is one of five which is to be used in the construction of a new plant by the power company. These castings are said to be the lar-

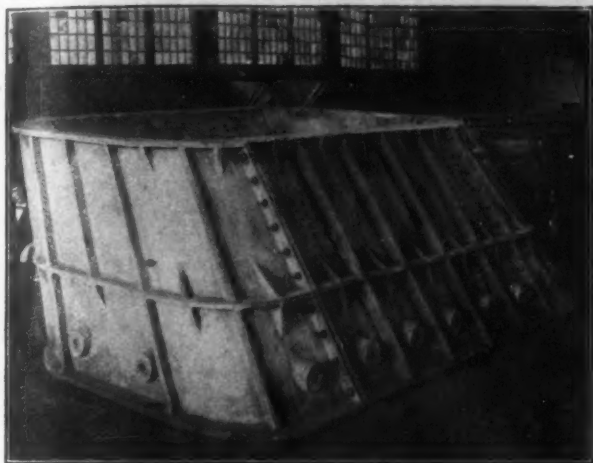


Fig. 1.—A 28,000-Lb. Casting Made by the Marshall Foundry Company, Pittsburgh, Pa.

gest ever made for this character of service, and the work of casting them in green sand molds involved some difficulties owing to their peculiar shape. These castings will be mounted on heavy concrete foundations, and as they are required to sustain a heavy load and are under constant pressure they had to be perfectly sound. The thimbles were 17 ft. 10 in. long, at the bottom, 10 ft. wide and 6 ft. high, and weighed 28,000 lb. each. The machining of all the joints and flanges of the castings was done by the Marshall Foundry Company.

The thrust bearing thimble, which is also one of the five, is of gray cast iron, and the inside diameter was 13 ft. 4 in., the external diameter 14 ft. 6 in. and the weight 20,000 lb. The mold for this casting was

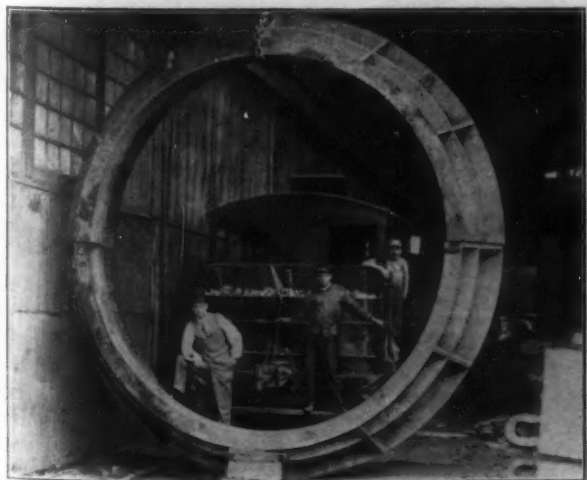


Fig. 2.—One of Five Large Thrust Bearing Thimbles.

of loam and formed by sweeps instead of patterns, and the pockets between the flanges and the intersecting rims were constructed by using dry sand cores. These

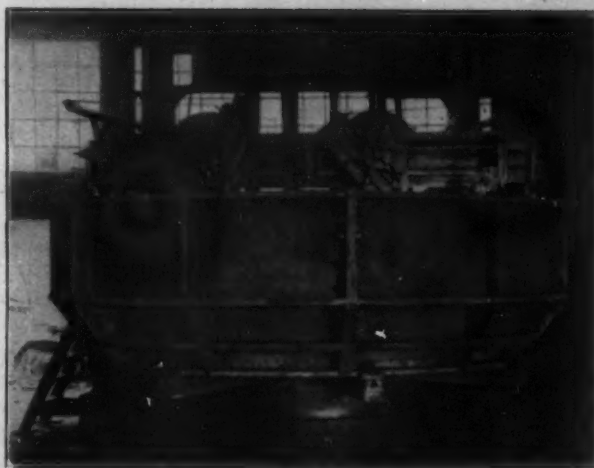


Fig. 3.—Finishing an Assembled Thimble on a Boring Mill in the Marshall Plant.

castings will also be subjected to heavy pressure, and therefore had to be carefully designed and constructed.

The company makes a specialty of loam or shell work, and Fig. 4 shows a carload export shipment of cast sections intended for vacuum pans in sugar mills which were made with sweeps. The company has made castings as large as 120 in. in diameter for manufacturing chemicals, while the loam work handled ranges from 18 in. to 15 ft. in diameter. These castings are only a few of the many difficult and interesting ones which have been made in the company's foundry since its organization 40 years ago. The daily capacity of the foundry is 250 tons, and the special

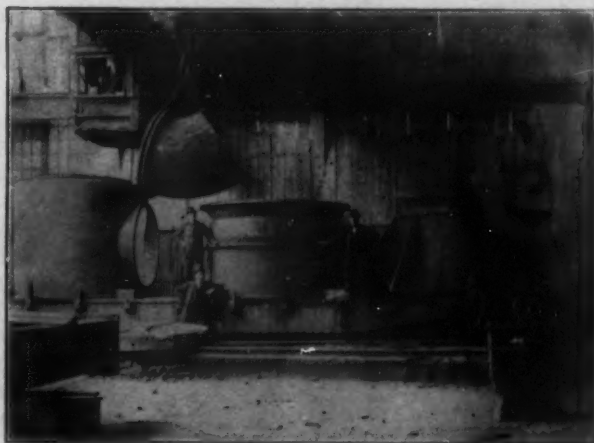


Fig. 4.—Sugar Mill Vacuum Pans Being Loaded for Shipping.

lines turned out are ingot molds and miscellaneous gray iron castings.

Railroad Equipment Orders.—The Hawley Lines, which several months ago were inquiring for 8000 cars, are now asking revised bids on a large portion of the amount, including 3000 all steel hopper cars, 250 steel underframe furniture cars, 250 automobile and 750 box cars. The Lackawanna has ordered 500 steel underframe box cars and 500 all steel hopper cars. The Norfolk & Western will build 500 hopper cars in its own shops. The Hudson & Manhattan has ordered 30 steel subway cars and the Pennsylvania 40 all steel passenger cars. The *Railway Age-Gazette* notes that the Bingham & Garfield, Salt Lake City, will be in the market for several hundred ore cars. The Seaboard Air Line is expected to buy 10 freight locomotives and 13 passenger cars. The Louisville & Nashville has ordered 100 ballast cars from the Rodger Ballast Car Company. It is reported that the Baltimore & Ohio will buy 105 passenger and baggage cars. Specifications from the Pennsylvania Railroad for freight cars and locomotives are looked for this month.

Ball Bearings in Machine Tool Construction*

The Present Standard Practice of American and German Builders

BY HENRY HESS.†

One of the oldest uses for ball bearings in machine tools is on the vertical spindles of drill presses; such use has been successful only when proper bearings, properly mounted, have been used. The Colburn Machine Tool Company showed at Atlantic City and elsewhere a heavy drill press that drove a $1\frac{1}{2}$ -in. drill through 31 in. of cast iron per minute, and a $3\frac{1}{2}$ -in. drill through $11\frac{1}{4}$ in. per minute; that means a pretty heavy thrust. This thrust was taken on Hess-Bright ball bearings of the self-adjusting seat type.

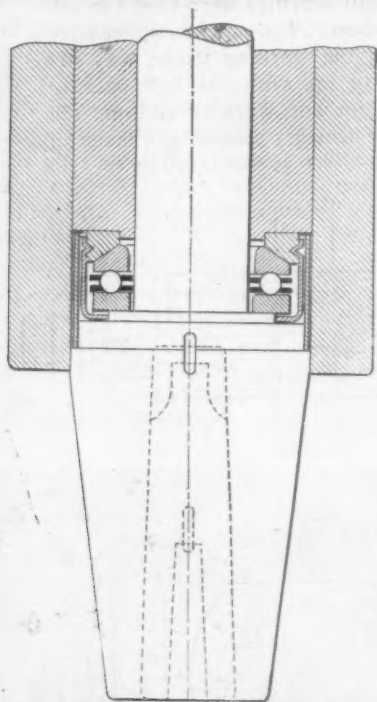


Fig. 1.—Ball Bearing of the Unit Type for a Drill Press Spindle Made by the Hess-Bright Mfg. Company, Philadelphia, Pa.

top on a ball bearing placed there rather than on one placed at the lower end. This is because the relatively small bearing at the top costs only a small portion of what a ball bearing big enough to sur-

round the column would come to. To relieve the friction due to the pressure that the sleeve exerts at the base of the column in a radial direction, this pressure is taken on one or more radial ball bearings arranged around the column; these small bearings also cost much less than a single large one and are quite as efficient. In the swinging arm type of radial drill, bearings are employed at the top and bottom to take the radial thrust, and a compensating seat thrust bearing is placed at the bottom to take the vertical load.

Fig. 1 shows a bearing of the cage type that may be handled as a complete unit and contains also the convex compensating seat washer. In this arrangement a sleeve, forming an oil well to keep the balls submerged is employed.

It is preferable to take the weight of a radial drill column at the

Milling and Planing Machines

The Becker Milling Machine Company, Hyde Park, Mass., in its catalogue on belted vertical milling machines, shows a speed box equipped with Hess-Bright ball bearings, reproduced in Fig. 2. Other prominent

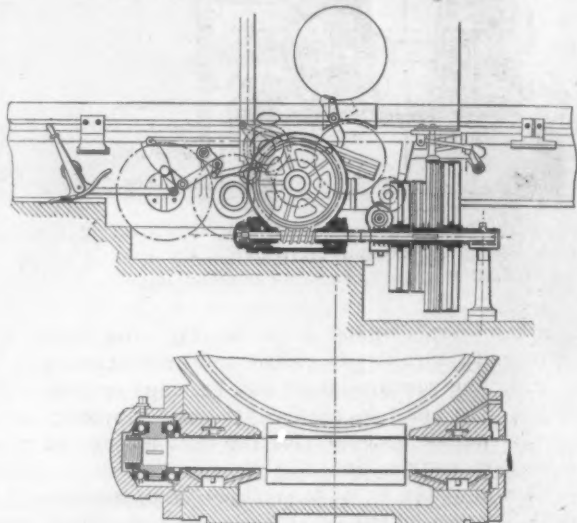


Fig. 3.—Ball Bearings for a Heavy Worm Driven 144-In. Planer.

American specialists in this line take the feed screw thrusts on ball bearings.

Fig. 3 is reproduced from a description in the *Zeitschrift des Vereins Deutscher Ingenieure* of a heavy worm driven 144-in. planer. It will be noticed that the two thrust bearings for taking the worm thrust both on the cut and the reverse strokes are quite conveniently mounted and housed in a cap at the end of the worm gear case. It has been found that the correct employment of suitable ball bearings does away with all likelihood of back lash from worn plain steps and considerably increases the ease of running of the planer and of its power efficiency.

Grinding Machines

In the vertical spindle of a surface grinder* built by the Blanchard Machine Company, Cambridge, Mass., shown in Fig. 4, you will notice that the weight is taken at the top on a thrust bearing, as is the radial load at this point on a radial, while the grinding thrust is taken just immediately above the face grinding wheel on a thrust bearing, all of the Hess-Bright type. The entire countershaft of a German grinding machine built by Unger of Stuttgart is mounted on Hess-Bright ball bearings.

In our own shops we also have remounted a number of our grinding machine countershafts, as well as the wheel spindles on ball bearings. We have found

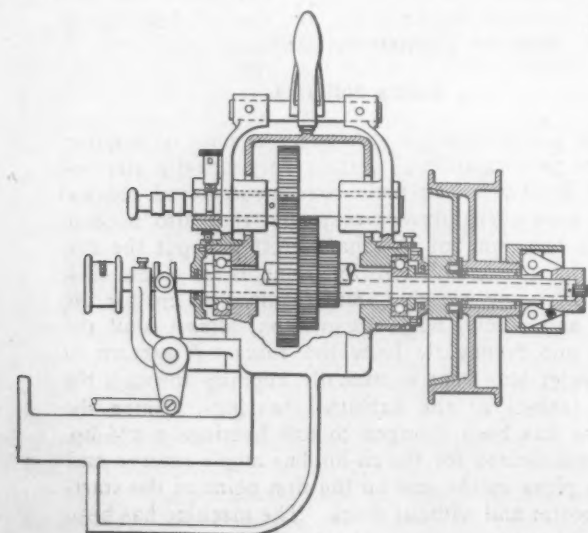


Fig. 2.—Ball Bearing Milling Machine Speed Box Used by the Becker Milling Machine Company, Hyde Park, Mass.

* From a paper presented before the National Machine Tool Builders' Association, at New York City, October 25 and 26, 1910.

† President of the Hess-Bright Mfg. Company, Philadelphia, Pa.

* *The Iron Age*, October 13, 1910, contained an illustrated description of this tool.

Mr. Rushmore has expressed his surprise that builders of this machinery do not regularly so mount their spindles.

Punch Presses

In the examples heretofore considered the ball bearings have been employed under conditions of fair uniformity as to load and at speeds ranging from the moderate ones of cutting tools to the higher speeds of grinding machines. That ball bearings are used with very decided success also under conditions of considerable shock is evidenced from their use in a heavy power press or punch where the flywheel or drive shaft is mounted on a ball bearing. This is a fairly heavy press as is indicated by the large driving gear weight of a ton. Carefully made comparative tests on this press showed that ball bearings decreased the idle stroke power by 54 per cent. The power required for the plain bearing during the working stroke was 16.8 hp., which reduced to 13 hp. with the ball bearing. The total time required for one working and one idle stroke was 13 seconds, of which 1 second was taken up by the working stroke. The power saving for the

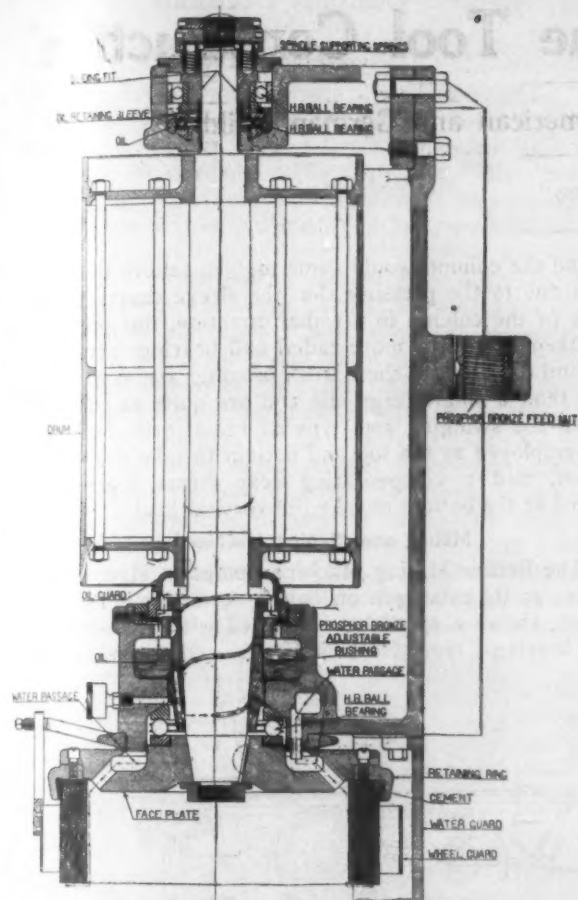


Fig. 4.—Spindle of the Vertical Surface Grinder Built by the Blanchard Machine Company, Cambridge, Mass.

that, while on the original plain bearings the belts were frequently thrown off when suddenly starting the machines, the substitution of ball bearings entirely stopped this. In addition all the various annoyances due to wear and the necessity for frequent lubrication have been done away with.

Mr. Hanson of the Pratt & Whitney Company was kind enough to permit me to refer to his use of ball bearings on one of his very heavy grinding machines, and Fig. 5 shows the entire load of a 10-in. and a 7-in. belt taken on two ball bearings. The Rushmore Dynamo Works has mounted a considerable number of its grinding and buffing heads on our ball bearings.

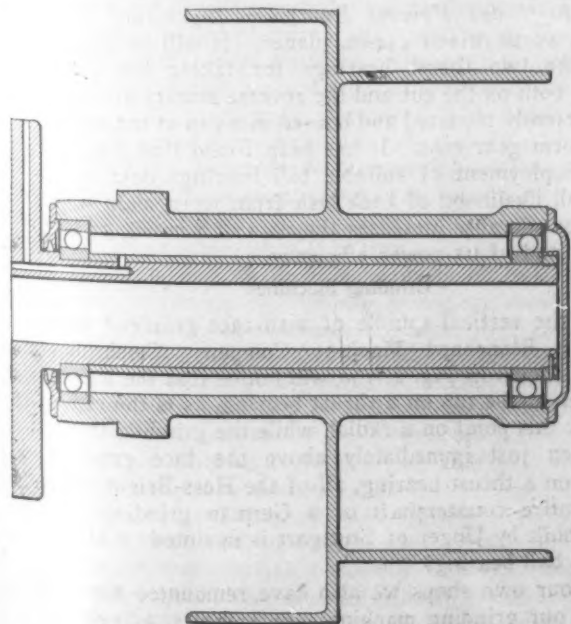


Fig. 5.—Ball Bearing for Pulley of a Heavy Grinder Made by the Pratt & Whitney Company, Hartford, Conn.

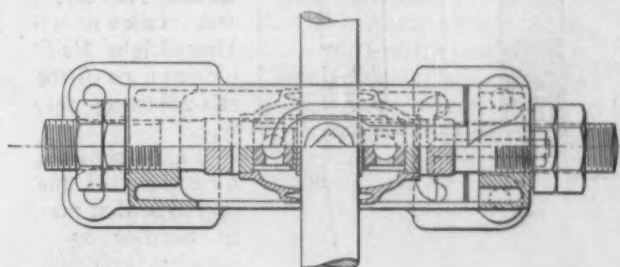


Fig. 6.—Detail of a Post Shifting Hanger Designed by the Hess-Bright Mfg. Company, Philadelphia, Pa.

complete cycle was 40 per cent. This press has been in use for a number of years, and the ball bearings do not yet show the slightest indication of wear.

Rolling Mill Tools

The proposition was put up to us once of improving the performance of certain very heavily stressed cold disk saws. The plain bearings required renewal about once every three weeks, and that also necessitated a returning of the shaft itself and put the machine out of commission for some time. This disk ran at 4100 rev. per min., and required 20 hp. for the drive, and would, when thrown on, almost stall the motor and frequently blow the fuses. A stream of cold water was kept continually running through the water jackets of the babbitted bearings. Since the machine has been changed to ball bearings a 7½-hp. motor substituted for the 20-hp. has ample reserve and readily picks up the saw on the first point of the starting rheostat and without shock. The machine has been running for over a year without evidence of the slightest deterioration in the bearings.

Woodworking Machinery

Among the largest European builders of wood-working machinery are Fleck & Sohne of Berlin. Of 159 types of tools they build, some 80 are now mounted on ball bearings. Tests have shown that the power savings on the idle run amount to 60 per cent., while under cut the actual horsepower saved is greater, owing to the greater load on the bearings. In addition to power savings, Fleck and others cite as fully as important the facts that wear is very much reduced, that all danger of bearings heating is eliminated, and that the consumption of lubricant is greatly reduced.

Among American woodworking machine builders the Defiance Machine Works mounts an 18-in. spoke lathe on these bearings. With the original babbitted bearings 2 hp. was required to run the cutter head idle and 7 hp. while turning an 18-in. spoke; mounted on ball bearings the reduction was from 2 hp. to 0.8 hp. for the idle running and from 7 hp. to 5.8 hp. while under cut.

The Advance Machinery Company considers a dovetailing machine one of the most difficult of wood-working machines to deal with and declares that while trouble was had with the dovetailer to a very considerable extent before the substitution of ball bearings, not a complaint since that change has been received. This concern has adopted them also for its shapers and other machinery.

Shafting

This is an essential portion of every machine tool, possibly not so much as concerns the main line, but certainly as to the countershafts. Fig. 6 shows the ball bearings embodied in a post hanger. Recent papers read before the American Society of Mechanical Engineers covering efficiency tests* may be referred to by those interested. The hanger is no longer the usual foundry job, but is a good example of machine tool design, as all the various supporting surfaces are machined. The usual rib construction has also been departed from in favor of the far superior box sections current in your own practice as machine tool designers and builders. Used as a countershaft, this hanger is equipped with a lug for the attachment of the shifter fork supporting arms, that can be set at any angle.

The first employment of these ball bearings was with the German Niles Tool Works Company of Berlin, where the entire line of countershafts was mounted on them. This was feasible without entailing greater costs than with plain bearings, in that only three sizes were employed for the whole range of tools. To do that the ends of the heavier shafts were necked down; this was permissible without a weakening of the shafts since the ball bearing itself is so short as to bring in no bending moments at all, but stresses the shaft at the resultant shoulders practically only when in shear.

Radial ball bearings can be had from stock in sizes ranging from less than $\frac{1}{4}$ -in. bore to $4\frac{1}{2}$ -in. bore, and in light, medium and heavy carrying capacities, up to 14,000 lb. In thrust ball bearings stock sizes run up to 28,600 lb. load at 10 rev. per min. Special ball bearings can be had to suit any demand, even up to 400,000 lb.

Contracts were awarded last week by the McKeesport Tin Plate Company, McKeesport, Pa., for furnaces, a gas producer and boiler setting in connection with the additional hot mill capacity, which will likely be two mills.

* "Line Shaft Efficiency, Mechanical and Economic," presented at the annual meeting of the Society, December 7 to 10, 1909. An abstract of this paper and the discussion on it was printed on page 1381 of *The Iron Age*, December 16, 1909.
"Improvements in Line Shaft Hangers and Bearings," presented at the spring meeting of the Society, May 31 to June 3, 1910. An abstract of this paper and the discussion on it was printed on page 1379 of *The Iron Age*, June 9, 1910.

Customs Decisions

Flexible Metal Tubing

The Board of United States General Appraisers has handed down a ruling defining the classification to be imposed on flexible metal tubing or hose, under the tariff act of 1909. The importers in the test case are Hensel, Bruckmann & Lorbacher, who objected to the assessment of duty made by the collector of customs at New York.

The tubing or hose is made of copper, and returned for duty under paragraph 151 of the new law as "flexible metal tubing or hose, not specially provided for in this section." This classification carries a duty of 30 per cent., whereas under the contention made by the importers the rate would be only $2\frac{1}{2}$ cents per pound under the provision in paragraph 176 specifying "copper pipes." It is apparent from the remarks of General Appraiser Fischer, who writes the decision for the board, that the issue is a close one. He thinks that the provision of the law under which the merchandise was assessed by the collector is more specific than the paragraph claimed by the importers. He accordingly overrules the claim. In doing so he says:

It is of course true that between the enumerations of an article, both equally specific, the one qualified by the "not specially provided for" clause must yield to the one in which the enumerations are not so qualified. We find it unnecessary, however, to apply that rule of construction in the case at bar. It is admitted that the goods are flexible copper tubing or hose, and we hold that the provision "flexible metal tubing," paragraph 151, tariff act of 1909, supplies a more definite and specific enumeration of the merchandise than the provision for "copper pipes" under paragraph 176. The protests are overruled, and the decisions of the collector affirmed.

The Cazadero Hydroelectric Plant

The Portland Railway, Light & Power Company, Portland, Ore., has recently placed in service, at its Cazadero plant, a 6300-hp. horizontal Francis turbine. This unit is the fifth furnished by the Platt Iron Works Company, Dayton, Ohio, for this plant and the results of official tests conducted show that all guarantees made by the builder have been exceeded.

The Cazadero plant is one of the most modern and successful hydroelectric developments to be found in this country and now has a total output of about 28,000 hp. It operates under a head of 125 ft. and furnishes power for the city of Portland. An additional development by the same company has recently been undertaken for which the Platt Iron Works Company is building the entire hydraulic equipment, including three 6000-hp. twin spiral flume turbines as well as the exciter turbines and other accessories.

A Direct Process in Washington.—The Washington Steel & Iron Company, Spokane, Wash., has commenced the construction of a plant at Leavenworth, Wash., 25 miles west of Wenatchee, to work the Rothert process for making high grade tool steel from titaniferous magnetite ore by one operation. Exhaustive tests are stated to have been made of the process in the experimental plant of the company at Hoquiam, which will be removed to Leavenworth. Crude oil will be used for fuel in the company's own specially constructed furnaces. A large mill site has been secured at Leavenworth which is ideal for the handling of the ore and the operation of a plant of large capacity. It will be but 15 miles from the ore beds and immediately on the railroad. It is stated that the company has near Blewett a deposit of 20,000,000 tons of iron ore. Associated with the company are M. A. Corner of Wallace, Idaho, and J. L. Torkelson, O. P. Moore and E. K. K. Allen of Spokane. E. H. Rothert is general manager.

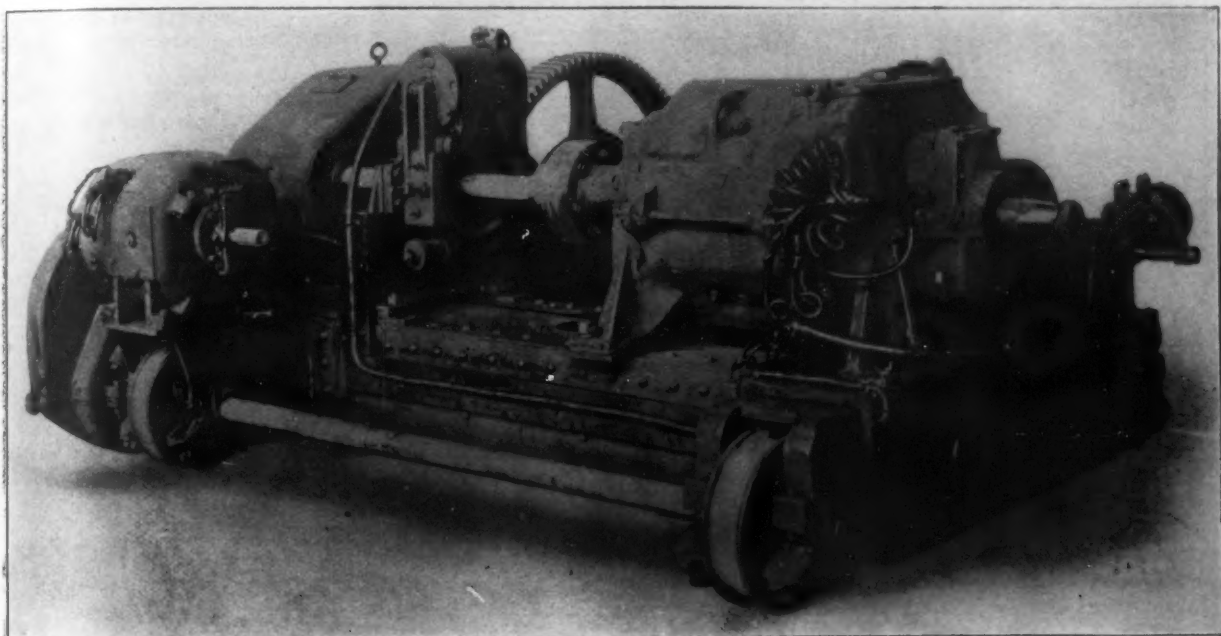
A New Niles Mill Trolley

A recent design of a crane trolley to meet the severest conditions existing in steel plants which was installed at the plant of the Inter-Ocean Steel Company, Chicago Heights, Ill., by the Niles-Bement-Pond Company, 111 Broadway, New York City, is illustrated herewith. The entire machine is built for strength and rigidity, and consists of two heavy box side frames connected together with a built up steel girt, the whole forming a rigid H section. This girt is rigidly braced by a cover plate extending its entire length, and the bearings supporting the drum, drum pinion shafts and truck wheels are cast integral with the side frames.

The trolley drive mechanism is extremely simple and consists of two sets of spur gears which are self-contained in an oil tight case, the shaft revolving in removable bearings. Westinghouse type K motors, especially designed for use where severe intermittent service is required, operate the trolley. These motors

load it is subjected to a pressure in excess of 200 lb. per square inch of surface. In action the brake is said to be noiseless and automatic and no thrusts are transmitted to its bearings, as it is absolutely self-contained on its shaft. Its action under all conditions of service is uniform, and it will not permit the load to run down unless driven by the hoist motor through a spur gear mounted directly on the brake. This gear, in common with all the others of the trolley, is made from a steel casting with cut teeth of the Brown & Sharpe involute standard and all pinions are steel forgings. The entire brake, motor gear and pinion are inclosed in an oil tight case and can be removed without disturbing any other mechanism. An electric brake of the solenoid type is attached to the motor shaft, sets instantly when the current is shut off and releases when the motor is started.

The truck wheels are forced onto the shaft and keyed in position. These shafts revolve in square half-bronze bushings, which are held from rotating by waste oil boxes underneath and from longitudinal



A New Type of Mill Trolley Installed at the Works of the Inter-Ocean Steel Company by the Niles-Bement-Pond Company, New York City.

are of inclosed type and nearly square in cross section.

The hoisting is done by extra pliable plow steel wire rope having a minimum factor of safety of seven compared with its ultimate strength. The hoist is driven by Westinghouse type MT mill motors, which are connected to the motor shaft by a flange compression coupling. This coupling may be instantly removed by relieving the pressure of its internal sleeve, thus avoiding the marring of the armature by driving off a pinion or coupling. The drum and running sheaves are 30 times the diameter of the rope, the latter being bronzed bushed and in duplicate in the girt and the bottom block. The drums are extremely heavy and have machine turned right and left hand grooves for the rope. The gear driving the drum has machine cut teeth, is forced on the end of it by hydraulic pressure and keyed in position. The drum shaft is also forced into the drum and is free from all torsional strains. The drum pinion, which is of forged steel, is forced on its shaft and keyed into position; this shaft also serves as the load brake shaft. It is supported by three bearings, one being integral with the side of the trolley and the other two forming part of the load brake gear case.

The load brake is of the maker's standard double disk type, with hard bronze wearing surfaces and is self-contained. When the crane is carrying its full

movement by flanges. Through bolts connect the waste boxes to the trolley sides in which there are dovetailed seats that take the thrust, thus relieving the bolts. By elevating the trolley $\frac{1}{4}$ in. the truck wheels can be readily removed.

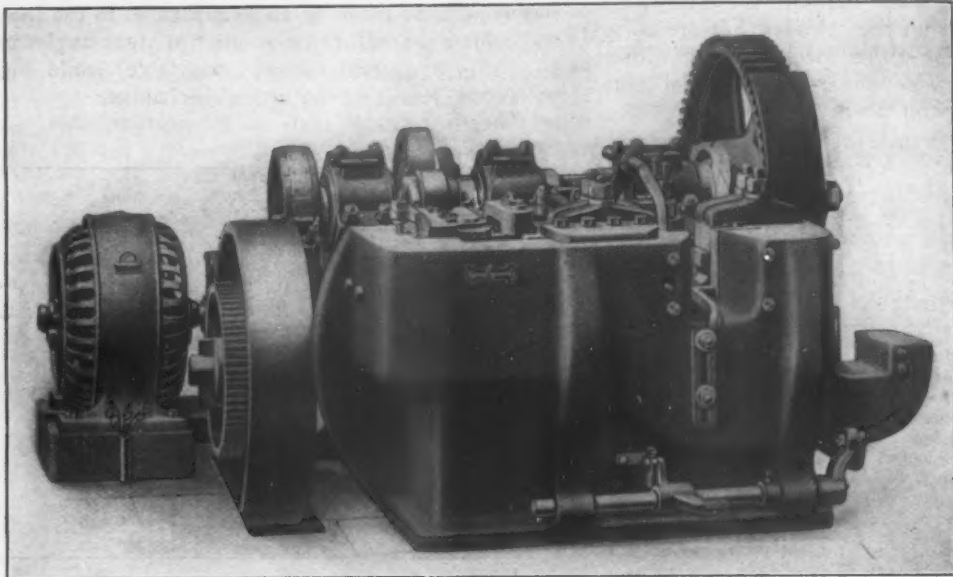
The bearing pressures on all parts of the trolley are very low, except on the truck wheel bearings, but in no case exceed 500 lb. per square inch. The speed of the truck wheel shaft is very slow, but on all the other bearings the pressure is reduced in proportion to the speed.

Negotiations have been practically completed by a group of New York bankers for a loan of \$50,000,000 to the Chinese Government for the reform of her currency, the promotion of industrial development and for the building of State railroads. The loan will be in the form of 45-year 5 per cent. bonds. This flotation is entirely distinct from the \$30,000,000 Hankow Railway loan, which has been under negotiation for several months.

The Cunard Steamship Company is stated to have approved plans for a steamship which will eclipse the Olympic of the White Star Line. The new vessel will be 1000 ft. in length. She will have 90,000 hp. which will give her a speed of 25 knots an hour.

An Improved National Forging Machine

One of the especially interesting exhibits at the recent exposition of bolt, nut and forging machinery at the plant of the National Machinery Company, Tiffin, Ohio, August 19 to 23, 1910, referred to in *The Iron Age* August 4 and September 1, was an improved line of forging machines. These machines are built in sizes having a capacity of 1½, 2, 2½, 3, 3½ and



An Improved Type of Forging Machine Built by the National Machinery Company, Tiffin, Ohio.

4 in.; the one shown in the accompanying engraving is the 2-in. type. The special features of this machine are the friction slip flywheel and the direct motor drive.

While the friction slip flywheel, upon which patents are pending, is extremely simple in detail, it is said to meet a positive requirement in forging machine construction. Its design is such as to protect the machine against the enormous strains imposed upon it by the momentum of the flywheel when the machine stalls because of an excess of stock or cold metal being fed into the dies. The flywheel is held between friction flanges keyed to the shaft, and when excessive material or cold stock is fed into the machine, preventing the heading tool from completing a full stroke, the flywheel slips between these flanges. This slipping action dissipates the momentum of the wheel and is said to eliminate the excessive shock attendant to a rigid flywheel, while at the same time it protects both the machine and the motor.

The type of motor drive employed is said to possess the advantages of compactness, long life and protection of the motor and freedom from petty repairs, while under the most severe tests it has proved to be a very practical method of directly connecting a motor and a forging machine. The motor is secured to a bracket bolted to the machine bed, and the pinion on its armature meshes with a gear which is bolted to the friction flywheel. Another interesting feature is the double cam mechanism operating the grip, which allows the opening and closing of the dies to be timed. This gives an unusually large upset or gathering capacity, and makes it possible not only to handle a wider range of work but to turn out more intricate forgings with a small number of operations.

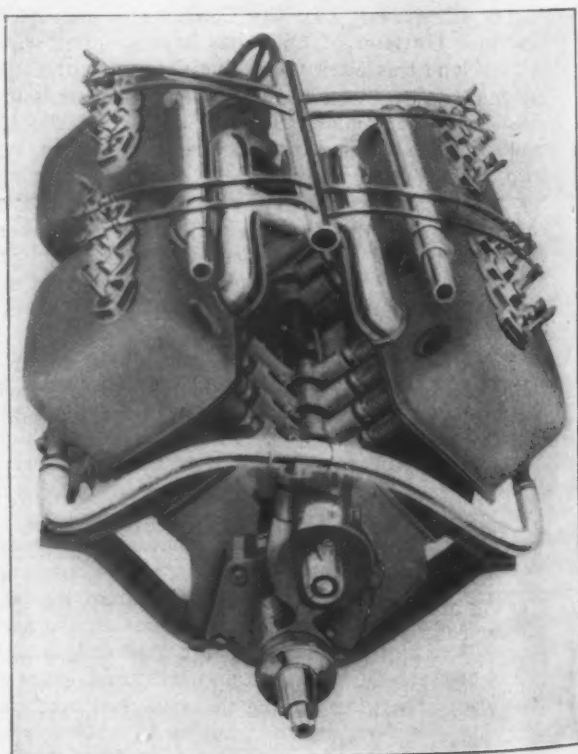
Correction.—An omission occurred in the article on the Inland Steel Company's Works which appeared in the issue of *The Iron Age* for October 20. On page 915 mention was made of the combination sheet and pair furnaces as being of the Swindell type. These furnaces are of both the Bailey and Swindell types.

The Herman Aerial Gasoline Engine

A new type of gasoline engine for aeronautical use has been developed by David L. Herman, 508 Moffat Block, Detroit, Mich. In its design the objects sought were extreme lightness and the elimination as far as possible of all moving parts.

As will be noticed from the engraving, the engine is of the four-cycle type, having eight L-shaped cylinders cast in pairs. This large number of cylinders was decided on because the application of power is more continuous and the vibration less than with a smaller number. The 16 valves of these cylinders are all operated by a single one-piece cam shaft, which also drives the centrifugal pump and gives positive circulation. This construction eliminates 36 moving parts, together with a large number of pins which are likely to work loose and cause trouble. The crank shaft is hollow and of crucible

chrome nickel steel, with three cadmium nickel bronze bearings. The cam shaft gear is of special alloy steel, meshing with an intermediate fiber filled gear, which gives a light and at the same time silent gear train.



A New Type of Gasoline Engine for Aeronautical Use Made by David L. Herman, Detroit, Mich.

The hardened and ground valve tappets have fiber inserts, and another special feature is that the gray cast iron valve heads are welded on steel stems, which not only makes it impossible for them to wear loose but also gives a valve head, the material of which has the same coefficient of expansion as the iron of the cylinder, thus reducing chance of breakage of the valves.

A special composition known as Aerial metal, which is said to be 15 per cent. lighter than aluminum and 50 per cent. stronger, is used for the crank case, the water jackets, gear housings, pipes and wherever a light alloy could be used without interfering with the serviceable properties of the motor. The crank case has large hand holes, which make the connecting rod bearings easily accessible. The water jacket is cast separate from the cylinder, which makes it possible to inspect and check up the cylinder castings more thoroughly than was the case heretofore. The water jackets are not shrunk on the cylinder, but are bolted in position with chrome nickel steel bolts, the difference of expansion between the iron and Aerial metal being taken up in the bolt holes.

The lubricating system is of the splash type with a force feed oiler for the crank case, which gives a positive method of lubrication. A high tension ignition system is provided and any desired make of magneto is furnished.

Two sizes of engine are built, the principal dimensions of which are as follows:

Length of stroke, inches.....	3¾	4¾
Diameter of cylinder, inches.....	3¾	4
Speed, revolutions per minute.....	1,200-1,800	1,200-1,800
Horsepower developed.....	34 to 45	56 to 70
Crank shaft diameter, inches.....	1½	1¾
Length of end bearing, inches.....	4¾	4¾
Length of center bearings, inches.....	3¾	4¾
Length of pin bearings, inches.....	1⅓	2
Diameter of piston pin, inches.....	¾	¾
Diameter of valves, inches.....	1½	2

In a recent test one of the smaller of these engines was mounted in an automobile truck loaded with sand and pig iron and has run over 5000 miles on very rough roads without repairs of any kind.

Employers' Liability in Ohio

The Employers' Liability Commission appointed by Governor Harmon of Ohio has been holding sessions in Cleveland this week to receive the views of employers and employees on the questions the commission is considering, particularly as to changes that should be made in the Norris-Matthews law, passed in April, 1910, by the Ohio Legislature. J. P. Smith, a member of the commission, in a recent article in a Cleveland paper, asks the question, "Shall the employer be compelled to pay for the carelessness and negligence of the employee?" He answers, "I believe that every honest, fair minded citizen will answer in the negative."

Employers at Cincinnati, Dayton and Youngstown, Ohio, who have already given their views to the commission, consider that the new Ohio law should be amended so as to relieve the employer of responsibility for negligence on the part of the employee or failure to report conditions which he knows to be defective and unsafe. This point was made in some of the communications of Cincinnati manufacturers printed in *The Iron Age* of October 27. The sentiment is growing among employees that while workmen should be compensated for accidents resulting from risks peculiar to certain employments there is danger in lessening the feeling of responsibility which employees should feel. This point was emphasized in the paper of Thomas D. West before the American Foundrymen's Association at Detroit in June, 1910, entitled "The Personal Equation in Industrial Accidents." This paper, which has been used in the present hearings in Ohio as expressing the views of many manufacturers, combats the view that the majority of accidents in a trade are incident to it and happen without fault on the part of either employer or employee. Mr. West argues that the general acceptance of such a view is likely to have serious results in taking away from the operative the sense of personal responsibility

and making him heedless of the effect of his actions on the safety of others.

The Flather Tilting Shaper Table

A demand for a tilting table as an adjunct in shaper work has led the Mark Flather Planer Company, Nashua, N. H., to evolve a combination tilting and swiveling table which permits angular adjustments of the work to be made on an axis parallel to the face of the column, as well as on another at right angles to it. Fig. 1 is a general view of the table, while Fig. 2 shows the details of the tilting mechanism.

The tilting table rests on the regular table which

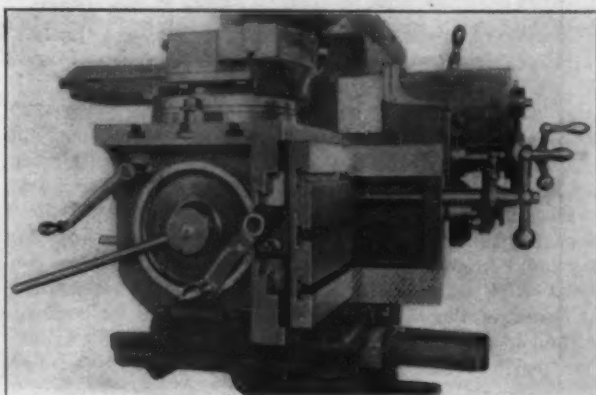


Fig. 1.—The New Tilting Shaper Table Made by the Mark Flather Planer Company, Nashua, N. H.

has lugs forming the bearings at *a* by which the tilting is accomplished. The angularity of the tilt is determined by the position of the two blocks *b*, the rounded corners of which rest against the angular surfaces *c*. One of these blocks is at the front of the table and the other at the rear. Each is threaded to receive one of the adjusting screws *d*, which are independent of one another. In adjusting the table one screw is loosened until the block which it controls is out of engagement with the table. The desired angle

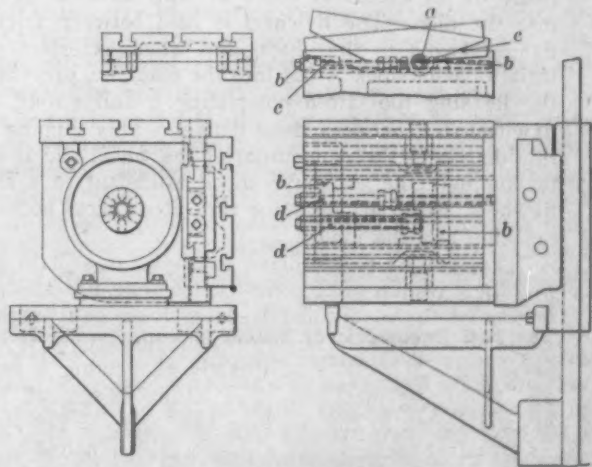


Fig. 2.—Details of the Table.

is secured by the other screw after which the first is tightened, so that the table rests solidly against both blocks and is locked securely. Each of these adjusting screws has a thrust block to prevent end play. The limit of angular adjustment is 5 degrees below the horizontal and 8 degrees above it. The swiveling of the table is accomplished in the usual way.

The furnace of the Zenith Furnace Company, at West Duluth, Minn., which went out August 13, was blown in October 19 after repairs.

New Tools and Appliances

A New Type of Slide Rule.—For facilitating the tedious and time consuming details in connection with mathematical work, Kolesch & Co., 138 Fulton street, New York City, have brought out the Calculigraph which like similar calculating devices is based on the well-known properties of logarithms. The instrument consists of two parts, a plate measuring 12 x 9½ in. containing the necessary graduations and a graduated bridge which has a number of parallel slots through which results are read directly from the plate. The large size of the plate and the corresponding coarseness of the graduations, it is said, tend to secure a high degree of accuracy. In operation the slots in the bridge are kept parallel with the lines on the plate and the former moves back and forth like the slide of an ordinary slide rule.

Wet Tool Grinder.—Hoysratt & Case, Kingston, N. Y., are building two sizes of wet tool grinder having 16 and 24 in. wheels in which the effort has been to produce a simple and efficient tool in which an even and steady flow of water can be maintained upon the wheel without using a pump. In this grinder the water is contained in a hollow head while the wheel runs in a separate trough and any desired amount of water can be supplied to the wheel through a hollow bronze connection. By simply shifting a lever beneath the bowl and in front of the machine these grinders can be used for either wet or dry work. Self-oiling, dirtproof bearings are used on the grinder and also on the countershaft and it is claimed that three or four oilings a year will keep them running perfectly.

Gasoline Engine Testing Base.—Joseph Tracy, 116 West Thirty-ninth street, New York City, has placed on the market a testing outfit for gasoline engines consisting of a cast iron bed plate and universal support for carrying the motor which may be connected to a dynamometer or prony brake. The four engine supports are mounted on small base plates provided with means for lateral and longitudinal adjustments and a vertical adjustment is provided by the sliding members of the supports which can be locked in any desired position. This bed plate forms a substantial foundation for any motor-testing operations and with the adjustable supports any style or size of motor can be securely seated and lined up quickly. All the contact surfaces of the bed plate and motor supports are planed thoroughly to eliminate the makeshift methods frequently employed for testing.

A Convenient Die Stock.—The Handy Mfg. Company, Bridgeport, Conn., has placed on the market a compact die stock made in the smallest practicable form. The tool is self-contained and no bushings, wrenches, &c., are required. The design is said to avoid all slippage while cutting and the leader screw has been eliminated. Four sizes are manufactured for cutting both right and left hand threads on pipe ranging from ¼ to 2 in. in diameter.

The Bell Pneumatic or Steam Hammer.—The Buffalo Foundry & Machine Company, Buffalo, N. Y., builders of the Bell steam or air hammer which is made in four sizes, the weights of the falling parts being respectively, 250, 450, 700 and 1500 lb. with cylinders 6, 8, 10 and 12 in. in diameter, has recently redesigned the valve gears of the two larger sizes. The change consists in replacing the oscillating valve formerly used by a balanced piston valve, but this improvement has not resulted in any change in the pattern or general appearance of the hammers.

Large Capacity Arbor Press.—Edwin E. Bartlett, 326 A street, Boston Mass., has designed a new type of arbor press in which the distance over the plate can be increased at will. A ratchet and pawl are employed in connection with the forcing mechanism which makes it possible to always use the lever in the most efficient position as the ratchet is keyed fast to the pinion while the pawl is held in the casting through which the lever passes. The lever is counterbalanced and automatically

comes to a vertical position when the pawl is disengaged and the ram is free to be moved by a hand wheel. The lever can slide in its casting so that the leverage employed can be varied as more or less power is required. These presses are mounted on wheels and can be easily moved about the shop.

Adjustable Locomotive Hub Plate.—For eliminating the lateral motion of the frame and boiler of locomotives, the Smith Locomotive Adjustable Hub Plate Company, 207 Commerce Building, Pittsburg, Kan., has patented a device to be placed on the inside of the wheel. This consists of a plate fitting into the bore of the hub and a liner placed on the inside of it, both being held in position by snap rings. Space is left between the plate and the liner which is filled with heavy grease applied through a hole with screw pressure from the outside of the driving wheel. This grease acts as a cushion behind the plate and by increasing the amount the plate is adjusted to any position to take up the lateral motion.

An Electrically Driven Sensitive Drill Press.—The A. J. Deer Company, Hornell, N. Y., is making an electrically driven sensitive drill press which is designed for automobile factories, garages, general repair shops and for use wherever a light portable tool is required. The motor is wound for operation on either direct or alternating 110 to 220 volt circuits and three changes of speed are obtained by the three-step driving cone pulleys. The spindle of the drill is counterbalanced and the table has a vertical adjustment and may be swung around the column. A chuck and lever feed are provided for the spindle.

Vertical Marble Working Lathes.—The F. R. Patch Mfg. Company, Rutland, Vt., has recently designed and built two vertical lathes and a large dimension drum saw having diamond cutting edges. These machines were shipped to the Colorado-Yule Marble Company and will be used in manufacturing the large marble columns for the Post-office at Denver. These columns are about 44 ft. long and the diameters are 5½ ft. at the base and 4½ ft. at the upper end. They are built in sections or drums and have 24 flutes, the lathes being designed to do the fluting by circular diamond saws and carborundum wheels.

The Fox Multiple Spindle Drilling Machine.—A new multiple spindle drill intended for the drilling of gas engine frames, cylinder parts, automobile transmissions, pump flanges and work of a similar character has been recently brought out by the Fox Machine Company, 815 North Front street, Grand Rapids, Mich. The tool is designed for either belt or motor drive and when the former is employed a single large diameter, broad face, constant speed pulley is used. There are six changes of spindle speeds and six changes of head feeds all obtainable through gear boxes and the transmission is of the selective sliding gear type. The capacity of the drill is eight 1½ in. drills. If desired a friction tapping device located on top of the column can be furnished. Expanding ring clutches are used and provision is made for their adjustment as it becomes necessary. The levers are all within easy reach of the operator and the drills may be stopped without shifting the belt. The maximum space which can be drilled is a rectangle 16 x 30 in. or a circle 24 in. in diameter. Two special features of the drill spindles are the exceptionally strong construction of the spindle bearings and supporting arms which greatly reduces the drilling strain and the ability to raise or lower the drills according to their varying lengths when set at very close centers.

Test Indicator for Screw Threads.—Joseph L. Wolfe, 859 Stratford avenue, Bridgeport, Conn., has brought out an indicator especially adapted for testing the threads on taps, dies, screws, &c., 1 in. or longer, accurately and rapidly. The instrument has two ball points which are brought into contact with the thread to be tested and the movement of these points around the thread being tested records its accuracy on the indicator dial, which is graduated to read thousandths of an inch and has a range of 0.024 in. on either side of the zero mark and enables

an inaccuracy of 0.0002 in. to be easily detected. The indicator shows whether the thread is fast or slow in thousandths of an inch and the movement of the pointer is in one direction if the thread is fast and in the opposite if slow, while if the thread is accurately cut the pointer on the indicator will remain at zero.

Knurling Tools.—The Miller Tool Company, New Britain, Conn., is making what is known as the six-in-one knurling tool, the name being derived from the fact that there are six knurls available that may be used either in pairs or singly. These are arranged in pairs of the same pitch so that three grades of cross and a similar number of single knurls are obtainable. When the latter is being used the turret is locked. All the knurls are machine cut and are mounted on hardened tool steel pins. The turret and holder are of hardened machine steel and the tool is designed for use on engine and turret lathes and screw machines for both heavy and light work.

A Disk Wheel Cementing Press.—An improved type of disk wheel cementing press constructed so that the top plate may be swung out of the way while the disk wheel is being glued and then swung back into position when pressure is to be applied, has been placed on the market by Charles H. Besly & Co., Chicago, Ill. The wheels are raised from the face of the press by a central shouldered shaft actuated by a cam movement. If pressure is to be applied the yoke is brought into engagement with a stud set in the pedestal and kept in position by the pressure, no lock being required. In raising the disk wheels the cam is thrown slightly over the center and against the bumper pin which holds the disk rigidly supported by its own weight. In lowering, the disk is raised slightly to permit the cam to come over the center and then lowered till the wheel rests on the pedestal casting. This is a desirable feature as the 26-in. wheel handled by this press weighs 125 lb.

A 21-in. Upright Drill Press.—A 21-in. drill press with back gears, positive geared feed and tapping attachment has been placed on the market by the Superior Machine Tool Company, Kokomo, Ind. The feeding mechanism is inclosed by a gear box mounted on the head which is stationary and the drive is by a vertical shaft driven from the spindle quill by spur gears. Four feed changes ranging from 0.006 to 0.016 in. per revolution of the spindle are available and these are obtained by simply shifting conveniently located handles attached to the gear box. The tapping attachment is of the maker's standard type equipped with friction gears inclosed with gear covers. A special feature of the drill press is the covering of all the gears by guards for protecting the workman. The machine will drill to the center of a 21-in. circle and the maximum distances between the table and the spindle and the base and the spindle are 20 and 37 in., respectively. The table has a traverse of 16 in. and the spindle which is bored to receive a No. 3 Morse taper has a traverse of 8 in.

Locating Machine.—For quickly locating centers on dies, jigs, templates and other work where accurate location is essential, the Beacon Tool Works, Naugatuck, Conn., has developed a machine which is provided with micrometer adjustment. Three sizes are made, the largest taking a block measuring 12 x 14 x 8 in. high and the smallest, one whose dimensions do not exceed 4 in.

A Fuel Oil Brazing Outfit.—The Gilbert & Parker Mfg. Company, Springfield, Mass., has recently placed on the market a fuel oil brazing outfit. Air and fuel oil are used in this burner, the combustion being completed in the burner itself with the result that a smoke free flame like that of gas is directed upon the work. The standard form of outfit is designed for attachment to a table, but if desired a portable form can be supplied.

Railway Motor.—The Allis-Chalmers Company, Milwaukee, Wis., has recently placed on the market a new railway motor known as its type No. 302. This motor is of the same general type as the others which the company builds. The field frame is of cast steel and is split horizontally through the armature and axle bearings. The pole pieces are made of soft steel punchings clamped

between malleable iron plates and securely riveted. Special insulation is used on the field coils and for final finishing the entire coil is treated with insulating varnish by the vacuum process. The armature bearings are in solid housings and are made large for strength and long wear. The bushings are of cast metal lined with high-grade babbit and fit the bore of the housing accurately. The armature core is built up of soft steel laminations carefully annealed and varnished after punching and ventilation is secured by leaving spaces between them at intervals. The nominal rating of the motor is 55 hp. at 500 volts and a two-motor equipment will operate city and suburban cars at a maximum speed of 30 miles per hour, while a four-motor equipment will operate interurban cars at a schedule speed of 24 miles per hour and a maximum of 40 miles.

Four-Slide Milling Machine.—The Garvin Machine Company, Spring and Varick streets, New York City, has recently placed on the market a special type of four-slide milling machine adapted for manufacturing operations such as cutting oil grooves in automobile axles, keyseating, fluting, squaring ends, notching, flattening, &c. The tool combines four separate machines. Each slide is independent so that three slides are working while the fourth is being loaded and the machine is constantly in operation. Two independent cutter spindles equipped with powerful back gears serve the pairs of slides at either end of the machine. Power and hand feed with an automatic trip are furnished and the slides have independent vertical screw adjustments and a quick lifting movement. Twelve changes of feed are available and the mechanism is driven from the countershaft.

Strong Automatic Engine Stop.—The Strong, Carlisle & Hammond Company, Cleveland, Ohio, has a new engine stop with which there is no reduction in area of the steam line, and no sprocket, chains and belts to move the different parts. This stop can be controlled either electrically or mechanically. A specially designed quick-closing valve having 25 per cent. more area than the steam pipe is used, which is closed by a tripping device consisting of a magnet and hammer, the latter knocking the valve rod from its seat, which can also be accomplished by hand. A speed limit device, consisting of a band with a projecting pin, is fastened to the engine shaft. When the revolutions exceed a certain number the pin closes an electric circuit which operates the tripping device and shuts the quick-closing valve. Beside the speed limit device, circuit closers electrically connected to the tripping device are generally installed in different parts of the engine room. By breaking the glass in a circuit closer and pressing a key the engine may be stopped. In connection with the Strong telltale the stop can stop an engine driving machinery by ropes when a strand breaks. Below the ropes a fine copper wire is stretched to the telltale and should a strand break the wire is generally broken and the engine stopped as previously described. If, however, the wire is merely pulled the electric circuit is closed by a back contact.

Pneumatic Riveter.—The Standard Railway Equipment Company, St. Louis, Mo., is equipping its Monarch riveter with an improved self-tightening spring locking device to prevent the barrel and handle from becoming loose in service. This device consists of a spring engaging a slot in the handle casting on one side and the teeth of a locking collar on the barrel at the other. To remove the handle the barrel is gripped in a vise with the handle uppermost and the tooth part of the spring is then disengaged from the collar by a screw driver or small chisel. To keep the spring from engaging the collar teeth while the handle is being unscrewed, a piece of sheet metal is inserted between the spring and collar for the former to slide on. A bar is placed through the grip hole of the handle which is unscrewed the same as an ordinary nut.

A Combination Drilling, Boring, Facing and Tapping Machine.—A two-spindle machine especially adapted for drilling, boring, counterboring and tapping has recently been placed on the market by the Hooper Mfg. Company, Freeport, Ill. The box-type column is

attached to a stationary base and at the opposite end is the cross rail to which the two spindle heads are gibbed. One of these heads is permanently fastened on the cross rail while the other is adjustable through a screw so that varying center distances can be obtained. Three-step cone pulleys drive the spindle through steel worms and bronze worm gears, the former having ball bearing end-thrusts and running in oil baths. Each spindle is driven and fed independently of the other and the feed is positively geared and can be tripped at any predetermined point automatically. Four independent feed changes are provided which are obtained by a lever swinging against an index plate and the spindles also have a hand feed and quick return lever. When tapping, gears are used to secure the lead required and to prevent stripping of the threads.

Blow-off Valves and Swing Unions.—L. J. Bordo Company, Philadelphia, Pa., has brought out a line of blow-off valves for steam, compressed air or oil. The important features are ease of operation and a plug which cannot lift from its seat and is always perfectly tight. The valve is operated by placing a wrench on the square portion of the plug and giving it a quarter turn. The lifting gland is permanently secured by a lock nut and by releasing the latter and turning the gland to the left, the plug is raised so it can turn easily. When the lock nut is released the lifting cam coupling the gland to the plug can be pulled out and the gland removed for repacking. The valves are made with screwed or flanged ends and straightway or angle. The unions are furnished either for straightway or angle connections, and the essential features are the same in both. In the angle type the bonnet is slipped over a grooved ell, followed by two brass rings with a gasket between them. These in turn are held in place by a split brass ring set in a groove in the ell. An outside threaded ell with a lock nut is next placed in position and is fastened to the first by a screwed bonnet. It is claimed that no matter which way the steam or fluid is flowing, the wearing parts of the joint are well protected.

Aurora Upright Drill Press.—The Aurora Tool Works, Aurora, Ind., is building a 20 and a 21 in. upright drill press of the stationary head type equipped with positive gear feeds, the mechanism of which is inclosed in a case attached to the column. The spindle driving quill transmits power to the feed box through bevel gears and a horizontal shaft and connection is made with the worn shaft on the head by a vertical shaft and bevel gears. The base is heavy and well ribbed and the columns are of large diameter with the metal distributed to secure strength. A back brace to avoid the possibility of springing the column, a feature common to all the drill presses built by this company, is provided. To insure substantial support for the top shaft, spindle, feed shaft and cone pulleys, the yoke is made a part of the column. The table is heavy and well ribbed and rests on a large circular bearing on the arm which is carefully machined to fit the column.

An Improved Upright Drilling Machine.—The Kern Machine Tool Company, Cincinnati, Ohio, has developed a new line of standard upright drills for general manufacturing purposes. The principal improvement in this machine over the company's standard construction is the device used to obtain the eight positive feeds. The feed box is placed on the sliding head utilizing the space back of the quick advance and return lever. This location does not interfere with the full traverse of the sliding head in either direction and allows the box to be of sufficient size to permit the feed gears and shafts to be of ample size and coarse pitch. The feeds range from 0.006 to 0.048 in. per revolution of the spindle and all changes are made without stopping the machine, the principle embodied in the box being the tumbler and sliding gear design. Another feature is the automatic trip for the feed mechanism which is located directly on the feed shaft and is in the form of a saw tooth clutch operated either by hand or by a trip dog on the sleeve rack which can be adjusted to any depth within the range of the spindle. This eliminates the gravity or

drop worm box and insures a constant full contact between the worm and the worm wheel at all times. Eight speed changes are provided and all exposed gears are protected by guards.

A 1500-lb. Steam Hammer.—The Massillon Foundry & Machine Company, Massillon, Ohio, has added a 1500-lb. steam hammer to its output, in the construction of which a combination of the two methods of fastening the slides in place is employed. The first of these is to use two bolts which pass through the main frame and into the slides and together with the thin and narrow wedges often used hold and back up the slides and the guides. The other scheme is to eliminate the bolts entirely and place the slides and guides in a cavity provided in the cheek of the main frame with adjusting bolts passing from the outside of the frame cheeks into the back of the slides and the guides. In this hammer two bolts pass through each slide and back through the main frame, thus throwing the strains of the ram on the frame of the hammer rather than on the cheeks. The advantages of this construction are that the cheeks of the main frame behind the slide back up and support the bolts which pass through the main frame while on the other hand the bolts passing through the main frame support and protect the cheeks on the main casting and the result is a construction which is practically unbreakable. The slide wedges are of forged steel and they extend the full width of the base or back of the slides. The cheeks of the main frame furnish a strong brace or bearing for these parts. The construction is further reinforced by projections on the cheeks which extend out beyond the wedges and cover a part of the front of the slides, thus making a pocket or cavity for them.

Trade Publications

Drop Forgings.—The Consolidated Mfg. Company, Toledo, Ohio. Catalogue. Size 6 x 9 in.; pages 24. Devoted to a line of drop forgings for the use of machine tool builders, cutlery, automobile, gun, bicycle, motorcycle and electrical appliance manufacturers, where they take the place of steel and malleable castings as the percentage of loss in machining is eliminated. Except one page of text, the entire catalogue consists of illustrations showing the different styles of forgings which the company has recently turned out.

Lubricants.—The Kent Lubricating Company, 500 Manufacturers' Building, Milwaukee, Wis. Catalogue. Treats of the Kent lubricants for various services. These include Kent grease, which is made in four different grades to meet all requirements in lubrication, also grease for automobiles and wagon axles, a boiler compound for neutralizing the action of scale-forming impurities in boiler feed water and an airbrake lubricant.

Mining Supplies.—Coshocton Iron Company, Monongahela, Pa. Booklet. Calls attention to a line of mine sheaves, rollers, grips and miscellaneous equipment for rope haulage. All the sheaves are cast with a chilled face and are rope lined with four-strand tarred Manila rope. The rollers are cast iron, with and without a chilled face, and also gum wood. Endless rope haulage cast steel tubular grips are shown, which are claimed to give the maximum stiffness with a minimum weight, while a protected screw and simplicity of parts keep down repair bills. These are made in all sizes for center or side bumper cars. Other equipment shown includes a cast iron bumper for all styles and sizes of cars and cast iron frogs or turnouts for 12 to 60 lb. rails. All the different pieces of equipment are illustrated and for the sheaves brief specifications are given of the various sizes and different dimensions.

Fire Hydrants.—Norwood Engineering Company, Florence, Mass. Loose-leaf catalogue. Relates to the Holyoke and the Walker fire hydrants. The former has been one of the standard types for towns, cities and factories for over 35 years and is of the gate type, with a downward opening valve which permits an unobstructed waterway. All the valve openings in this hydrant are $\frac{1}{4}$ in. larger than the listed size, and the posts and heads have increased waterways which minimize the friction loss. If desired these hydrants can be furnished with either independent inside or outside gates for each nozzle. The special feature of the Walker hydrant is the rubber faced bronze mounted gate. The illustrations show both hydrants in elevation and section and tables of dimensions are included.

Siphons.—Schutte & Koerting Company, Twelfth and Thompson streets, Philadelphia, Pa. Catalogue 2, section A. Describes the Koerting universal siphon or steam jet for moving water and other liquids. These are made with brass or iron bodies and brass nozzles, and connections are provided on the top

and both ends for the steam and discharge pipes. The illustrations show the different types of siphons and their uses, the latter being supplemented by text.

Woodworking Machinery.—Hall & Brown Woodworking Machine Company, 1913 North Broadway, St. Louis, Mo. Pamphlet and catalogue. The former illustrates and describes briefly a few of the more important new machines designed for use in various woodworking industries. These include matchers, surfacers and matchers, double surfacers, planers, tenoners and a number of different types of saws. All of these tools are illustrated and their salient features brought out in the text supplementing the engravings. The catalogue is devoted to the company's Twentieth Century series and consists of views of the different machines making up the line, the majority of which are the full size of the page, 13 x 21 in., and the description is given on the other side of the leaf.

Brickmaking Machinery.—The Arnold-Creager Company, New London, Ohio. Booklet. Size 8 x 10½ in.; pages 24. Refers to a complete line of brickmaking machinery and supplies. These include brick molds, machines for operation by steam engines or animal power, pug mills, disintegrators, elevators, automatic cutters, barrows and trucks and kiln parts. The different pieces of machinery are illustrated and described and brief specifications are appended.

Deep Well Pumps.—P. K. Wood Pump Company, Los Angeles, Cal. Booklet. Concerned with the Wood's deep well propeller pump, in which the water is raised by the revolution of a screw at high speed. In the operation of this pump the moving element or propeller throws the water against the casing, where it is forced up by interior guide blades, and this process is repeated until the water reaches the discharge outlet of the pump. No increase in speed is required for additional depth in using this pump, as more runners are added and this is said to increase the efficiency of the pump. The illustrations show the various styles of pump built and there are a number of views of installations.

Automobile Tires and Rims.—The Firestone Tire & Rubber Company, Akron, Ohio. Three booklets. These point out the advantages of the Firestone pneumatic tires for automobiles and the Firestone dual pneumatic tires and quick detachable rims for motor trucks. The automobile tires are made in different styles for the standard types of rims, and demountable rims are used for carrying spare tires inflated and ready for use, thus furnishing a convenient means of quick and easy tire changing on the road. The dual pneumatic tires are formed by fitting two pneumatic tires side by side on each of the rear wheels of automobile fire engines, chemical engines, hose wagons, motor ambulances and auto patrol wagons. These tires can be removed for repairs the same as a single tire.

Electric Motors.—The Emerson Electric Mfg. Company, St. Louis, Mo. Five bulletins. No. 3139, replacing No. 3133, and 3140, replacing Nos. 3100A and 3136, call attention to a complete line of single-phase induction motors. Those covered in the former are of the back-geared type with countershafts ranging from ½ to ½ hp., and the latter are of the full load start clutch type, ranging from 1-20 to ½ hp. No. 3310, replacing 3308, illustrates an electric blower for use in connection with hot air residence furnaces. No. 3910, replacing 3907, illustrates and describes a line of family sewing machine motors for direct and alternating current circuits, while No. 3911, replacing 3905, treats of factory sewing machine motors with power transmission. In all the bulletins the various styles of motors are illustrated, brief specifications are given and tables of the principal dimensions appended.

Electrical Machinery and Appliances.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4749 gives general descriptions and specifications of a line of alternating current switchboard panels. These are built in three sections and the pages of the bulletin are divided correspondingly, so that the designer may have before him a picture of the complete panel desired, together with the full description of the equipment. No. 4755 illustrates and describes the equipment used in the electrification of the Cascade Tunnel of the Great Northern Railway Company. The difficulties encountered before the work was done and the manner in which these were overcome later serve to show the ability of electric traction to increase the capacity of sections of railroads where, owing to certain physical conditions, operation by steam locomotives has reached its limit. No. 4767 refers to both alternating and direct current motors for use in steel mills and describes especially the 6000-hp. 6600-volt induction motors recently installed in the Gary plant of the Indiana Steel Company.

Wire Belt Lacing and Babbitt Metal.—J. M. Hayden & Co., 6 Pearl street, Grand Rapids, Mich. Booklet. Refers to the Globe composition wire belt lacing, which is said to make a smooth joint, conform perfectly to the pulley, prevent any loss of contact between the belt and the pulley where the joint is made and will not cut through the belt. The Globe box metal is said not to require as great heat as many to melt it, stays liquid longer and in forming the lining is free from defects.

Fire Protection Apparatus.—Eureka Fire Hose Mfg. Company, 13 Barclay street, New York City. Catalogue No. 2. This is the company's 1910 catalogue describing and illustrating the various brands of fire hose and supplies for railroads, steam-

ships, wharves, factories, hotels and public institutions. The hose includes a wide range of styles from a 4-ply fire hose to the ordinary garden hose. All of these are illustrated and briefly described, and a price-list and the various sizes of each brand made are included. Space is also given to accessories, such as ring couplings, spanners, play pipes, shut-off nozzles, hose racks and reels, hose carts, fire extinguishers, lanterns, axes and crowbars and holders. These also are illustrated, and where more than one size is made a table of capacities is appended.

Gear Shields.—The Ironsides Company, The Wyandotte, Columbus, Ohio. Circular. Concerned with the Ironsides gear shield, a lubricant for electric railroad use. The results of tests made on a number of these shields when in use on city and interurban cars are given, and a drawing shows the condition of the gear after running 317,869 miles with an Ironsides gear shield.

Metal Sheets.—The Stark Rolling Mill Company, Canton, Ohio. Mailing card. Concerned with Alumatoyd sheets for automobile parts and bodies. These sheets have a smooth surface to which paint adheres readily and is retained. One of the particular advantages claimed for these sheets is that paint applied to them will not scale, as the sheets will not rust and rust is the usual cause of paint scaling.

Bar Iron and Iron and Steel Shapes.—John Helmuth & Co., 30 Church street, New York City. American representatives for William Cooke & Co., Ltd., Sheffield, England. Catalogue. Size, 5½ x 8 in.; pages, 40. Contains a list of the various brands of Cooke's refined iron, with photographs showing the fractures and physical tests obtained with them. The various rolled iron and steel shapes are illustrated and lists of the various sizes and extras given. Records of tests made with several sizes of Cooke's Best Yorkshire Iron are appended.

Pipe and Lap Welded Casing.—Wheeling Steel & Iron Company, Wheeling, W. Va. Booklet. Covers the various sizes of black and galvanized steam, gas and water pipe which is made in the standard, extra strong and double extra strong weights. The different sizes of lap welded casing fitted with V threads and protected sleeve couplings are listed, and space is also given to line and drive pipe, oil well tubing and couplings for standard wrought pipe, lap welded casing and patent sleeve tubing. Complete tables of weights, dimensions and prices of the different sizes are included.

Washers.—The Positive Lock Washer Company, Avenue A, Newark, N. J. Folder. Concerned with a nut locking device for railroad track joints, crossings, frogs, switches, locomotive and car frames, trucks, draft rigging, truss rods and brake beams, electric motors, bridges and machinery. The washer consists of a piece of flat steel bent to circular form, with projections on the ends so that the body of the washer carries the load of compression and the ends are relieved, thus keeping the strength constant. The barbs being free to move when subjected to vibration force themselves into the nut and the metal backing and prevent the former from turning.

Portable Hoists.—James P. Dunn, 6616 Lawview avenue, N. E., Cleveland, Ohio. Catalogue. Concerned with Bailey's steel and iron portable hoists, which are designed for use in monument works, cemeteries, stone yards, factories, warehouses, car and gas works, construction, bridge building and all kinds of engineering work. These hoists are made with both single and double purchase and in four sizes, having capacities of 2, 4, 6 and 10 tons, respectively. It is stated that one man can raise the maximum load of each hoist and hold it at any point, while in lowering the weight of the load lowers it at any desired speed.

Wood Split Pulleys.—Saginaw Mfg. Company, Saginaw, Mich. Catalogue. Size 6 x 9 in.; 46 pages. Deals with the Gilbert wood split pulleys, which are said to be lower in first cost than the same type of iron or steel pulleys and will give as long service and permit lighter and less expensive shafting and hangers to be used on account of their lighter weight. The different styles and sizes of pulleys are illustrated and described, and a complete price-list and telegraphic code are appended.

Cold Drawn Steel Tubes.—National Tube Company, Frick Building, Pittsburgh, Pa. Blotter. Call attention to a series of advertisements regarding the manufacture of Shelby seamless cold drawn steel tubing, the first of which appeared in *The Iron Age*, August 19, 1910. The illustrations show primitive forms, methods of manufacture and uses of tubing.

Automobiles.—The Royal Tourist Car Company, Cleveland, Ohio. Catalogue. Concerned with the model M, series 2 car, having a four-cylinder motor and developing speeds from 5 to 65 miles per hour. The cylinders are vertical and in pairs, with valve chambers, water jackets and cylinder heads cast integral. Brief specifications of the car are given, with views of it and the factory where it is made.

Refrigerating and Ice Making Machinery.—The Creamery Package Mfg. Company, 182 Kinzie street, Chicago, Ill. Catalogue. Illustrates and describes a line of refrigerating and ice making machinery built in a number of different sizes. The various machines are illustrated and described with tables of dimensions and a number of views show installations of apparatus made by this company.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—	
Refined Iron:	
1 to 1½ in. round and square.....	¢ 1.90
1½ to 4 in. x ½ to 1 in.....	¢ 2.10
1½ to 4 in. x 1 to 3-16.....	¢ 2.10
Rods—¾ and 1-16 round and square.....	¢ 2.10
Angles:	
3 in. x ½ in. and larger.....	¢ 2.10
3 in. x 3-16 in. and ½ in.....	¢ 2.30
1½ to 2½ in. x ½ in.....	¢ 2.30
1½ to 2½ in. x 3-16 in. and thicker.....	¢ 2.10
1 to 1½ in. x 3-16 in.....	¢ 2.30
1 to 1½ in. x ½ in.....	¢ 2.30
¾ x ¾ in.....	¢ 2.50
¾ x ¾ in.....	¢ 3.55
¾ x 3-32 in.....	¢ 3.85
Tees:	
1 in.....	¢ 2.65
1½ in.....	¢ 2.45
1½ to 2½ x 3-16 in.....	¢ 2.15
1½ to 2½ x 3-16 in.....	¢ 2.35
3 in. and larger.....	¢ 2.15
Beams:	
Channels, 3 in. and larger.....	¢ 2.00
Beams—1½ to 6 x 3-16 to No. 8.....	¢ 2.30
"Burden's Best" Iron, base price.....	¢ 3.15
Burden's "H. B. & S." Iron, base price.....	¢ 2.85
Norway Bars.....	¢ 3.60

Merchant Steel from Store—	
Bessemer Machinery.....	per lb. 1.90
Toe Calk, Tire and Sleigh Shoe.....	2.50
Best Cast Steel, base price in small lots.....	70

Sheets from Store— Black	
One Pass, C. B.	R. G.
Soft Steel.	Cleaned.
No. 16.....	¢ 2.80
No. 18 to 20.....	¢ 2.90
No. 22 and 24.....	¢ 2.75
No. 26.....	¢ 3.10
No. 28.....	¢ 3.30

Russia, Planished, &c.	
Genuine Russia, according to assort- ment.....	¢ 12 @ 14½
Patent Planished, W. Dewees Wood.....	¢ A, 10¢; B, 9¢ net.

Galvanized.	
Nos. 12 and 11.....	¢ 2.95
Nos. 22 to 24.....	¢ 3.30
No. 26.....	¢ 3.50
No. 28.....	¢ 3.80
No. 29 and lighter 36 inches wide, 25¢ higher.	

Genuine Iron Sheets— Galvanized.	
Nos. 22 and 21.....	¢ 5.75
No. 26.....	¢ 6.25
No. 28.....	¢ 6.50
Corrugated Roofing—	
2½ in. corrugated.....	Painted Galv.
No. 26.....	¢ 100 sq. ft. \$3.85
No. 28.....	¢ 100 sq. ft. 2.95
No. 29.....	¢ 100 sq. ft. 2.60
No. 29.....	3.75
Tin Plates—	
American Charcoal Plates (per box.)	
"A.A.A." Charcoal:	
IC, 14 x 20.....	¢ 46.35
IX, 14 x 20.....	7.00
A. Charcoal:	
IC, 14 x 20.....	¢ 54.40
IX, 14 x 20.....	6.50
American Coke Plates—Bessemer—	
IC, 14 x 20.....	¢ 44.40
IX, 14 x 20.....	3.10
American Terne Plates—	
IC, 20 x 24 with an 8 lb. coating.....	¢ 8.50
IX, 20 x 28 with an 8 lb. coating.....	10.50

Seamless Brass Tubes—	
List November 12, 1908.....	Base price 18¢
Brass Tubes, Iron Pipe Sizes—	
List November 13, 1908.....	Base price 18¢
Copper Tubes—	
List November 13, 1908.....	Base price 21¢
Braze Brass Tubes—	
List August 1, 1908.....	199¢
High Brass Rods—	
List August 1, 1908.....	14½¢
Roll and Sheet Brass—	
List August 1, 1908.....	14½¢

Brass Wire—	
List August 1, 1908.....	14½¢
Copper Wire—	
Base Price.....	Carload lots mill 14¢

Copper Sheets—	
Sheet Copper Hot Rolled, 16 oz (quantity lots).....	¢ 18
Sheet Copper Cold Rolled, 1¢ advance over Hot Rolled.....	
Sheet Copper Polished 20 in. wide and under, 1¢ square foot.....	
Sheet Copper Polished over 20 in. wide, 2¢ square foot.....	
Planished Copper, 1¢ square foot more than Polished.	

METALS— Tin—	
Straits 17½.....	¢ 20.00
Copper—	
Lake Ingot.....	¢ 14.00
Electrolytic.....	¢ 14.00
Casting.....	¢ 14.00
Spelter—	
Western.....	¢ 6.00
Zinc.	
No. 9, base, casks.....	¢ 2½ (Open).....
Lead.	
American 17½.....	¢ 3.50
Bar.....	¢ 3.50
Soldier.	
½ & ¾, guaranteed.....	¢ 22.00
No. 1.....	¢ 20.00
Refined.....	¢ 18.00
Prices of Solder indicated by private brand vary ac- cording to composition.	

Antimony—	
Cookson.....	¢ 1.00
Hallett's.....	¢ 1.00
Other Brands.....	¢ 1.00

Bismuth—	
Per lb.....	\$2.00
Aluminum—	

No. 1 Aluminum (guaranteed over 99% pure), in bars for remelting.....	Base Price 14¢
Rods & Wire.....	Base Price 14¢
Sheets.....	Base Price 14¢

Old Metals.	
Dealers' Purchasing Prices Paid in New York	

Copper.	
Heavy cut and crucible.....	¢ 10.75 @ 11.00
Copper, Heavy and Wire.....	¢ 10.50 @ 10.75
Copper, Light and Bottoms.....	¢ 9.50 @ 9.75
Brass, Heavy.....	¢ 7.50 @ 7.75
Brass, Light.....	¢ 5.75 @ 6.00
Heavy Machine Composition.....	¢ 9.50 @ 9.75
Clean Brass Turnings.....	¢ 7.00 @ 7.25
Composition Turnings.....	¢ 8.25 @ 8.50
Lead, Heavy.....	¢ 2.50
Lead, Tea.....	¢ 1.50
Zinc Scrap.....	¢ 1.25



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ing effected through the use
of **Nicholson Files.**

Their hard cutting surface
and perfect temper gives
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that makes them by far the
most **economical** of all
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styles to use. Our book,
"File Philosophy," tells
how best to use them.



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